News about

B. F. Goodrich Chemical *raw materials*

Special Purpose Materials That Help Rubber Compounders

THE materials listed here supplement the well-known Hycar nitrile rubbers and offer many advantages in developing and improving compounds for specific applications. Check them over, and write for technical information on your requirements. We'll help you select the material best suited to your needs. Please address Dept. HB-11, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, O. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar 4021	***Polyacrylic acid ester***—Excellent high temperature air and oil resistance. Used where air and hot oil resistance at temperatures above 300° F. are needed; ozone, light and flex resistant applications.
Hycar 1312	***A liquid nitrile copolymer***—Excellent non-migrating, non-extractable, non-volatile polymeric-type plasticizer for rubber and plastic compounds. Useful in nitrile rubber sponge, friction compounds and for tackifying in roll building operations; in vinyl plastisol compounding; in modification of liquid phenolics and phenolic solutions.
Hycar 1411	***High acrylonitrile copolymer***—finely divided, non-soluble powder. Used in modification of phenolic and melamine resins; blends with other Hycar rubbers for improved smoothness of extrusions and calendered goods.
Hycar 2001	***Styrene copolymer***—Oil soluble, with high electrical properties. Used in electrical applications; binder for grinding and cut-off wheels; special adhesives.
Good-rite RESIN 50	***High styrene copolymer***—white, free-flowing powder. Reinforcing and processing aid for use with GR-S and other rubbers. Used in shoe soles, floor tiling, extrusions, rolls, golf ball covers and other high Durometer applications.
Good-rite VULTROL	***Retarder activator***—free-flowing flake. For crude, GR-S and nitrile rubber stocks. Prevents scorching at processing temperatures the year 'round. Safe processing with no sacrifice of rate of cure. Beneficial to heavy-loaded or highly-accelerated compounds; particularly effective with high abrasion furnace blacks.

B. F. Goodrich Chemical Company

A Division of The B. F. Goodrich Company

Hycar Reg U S Pat Off

American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

Really holds together!

TY·PLY "UP" and "RC"

For Versatility in Bonding All Types of Natural Rubber and GR-S Compounds to Metal

Very suitable for natural rubber stocks (both normal and low-sulfur), standard and cold-polymerized GR-S's, polybutadiene, oil-modified GR-S, arctic-type GR-S and natural GR-S blends. Both adhesives have excellent shelf and working stability; are insensitive to weather or ozone conditions; and work well over a wide range of curing temperatures.

TY·PLY **Q** or **3640** for bonding Natural, GR-S, and Butyl

TY·PLY **S** for bonding Neoprene

TY·PLY **BN** for bonding N-types

TY·PLY will adhere most vulcanizable rubber compounds to almost any clean metal surface

Marbon

MARBON CORP.

GARY, INDIANA

SUBSIDIARY OF BORG-WARNER

TY·PLY has stood the test of time . . . since '39

Equip your plant with this *versatile*

NRM

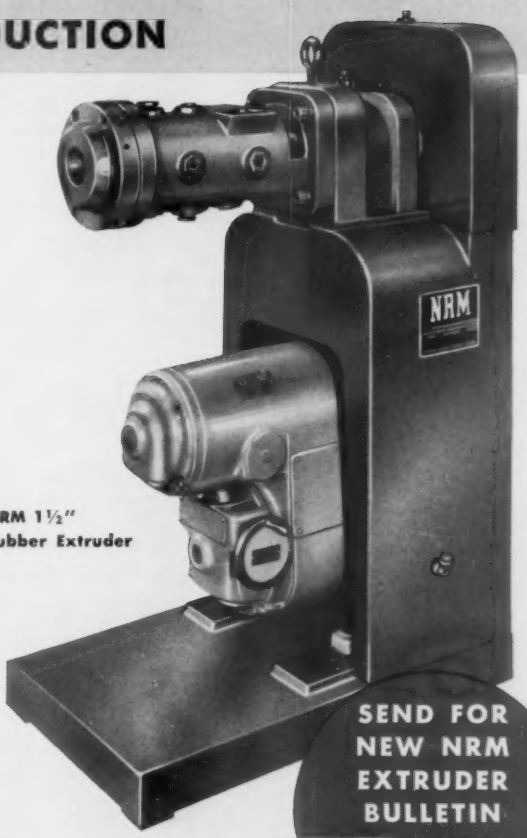
1½" RUBBER EXTRUDER

Use it in

★ LABORATORY WORK
★ PILOT OPERATIONS
★ ACTUAL PRODUCTION

By producing the same conditions of rubber heating, cooling and compression found in large production-size Extruders, the NRM 1½" Rubber Extruder makes development work faster and more accurate. In design, materials and workmanship, it is the equal of any Extruder in the NRM Line. A few of its "big extruder" features are: corrosion-resistant cylinder construction to assure long, trouble-free life; undercut feed box for continuous infeeding of variously sized stock; and heavy-duty gear housing with radial thrust bearings.

While designed primarily for laboratory work, the NRM 1½" Extruder is widely used in the industry for production of small cross-section extrusions. For use with the 1½", NRM offers rod and tubing dies, as well as a special die for testing the extrudability of stocks. Write for more details on this time saving, money-making NRM 1½" Rubber Extruder today.



NRM 1½"
Rubber Extruder

SEND FOR NEW NRM EXTRUDER BULLETIN

Explains the construction, operation and performance features of NRM Rubber Extruders. Read the facts and make your next extruder purchase an NRM.

2327

NATIONAL RUBBER MACHINERY COMPANY

NRM

Creative Engineering

General Offices & Engineering Laboratories: 47 West Exchange St., Akron, Ohio
East: 384 Getty Ave., Clifton, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Cal.
Export: Gillespie & Company, 96 Wall St., New York 6, N. Y.

BETTER GLOVES BETTER PROFITS

with easier-processing CHEMIGUM

Rubber gloves for chemical workers often have been a problem to their manufacturers. Ordinary rubbers cannot withstand the deteriorating effects of a number of chemicals, particularly oils, solvents and alkalies. Those few that can, are difficult to process – cause headaches and higher costs.

Solution to the problem for one glove-maker came in the form of a solution of CHEMIGUM—the nitrile rubber noted for its ease of processing and outstanding physical properties. This user found CHEMIGUM gave him faster, more uniform "breakdowns" on the mill and excellent solubility characteristics. It also gave him a glove of superior chemical resistance and general durability.

CHEMIGUM is an extremely uniform rubber, specifically designed and made to be easy-processing. It actually tends to soften rather than toughen on the mill. And this processability is attained without sacrifice of oil resistance or physical properties. Moreover, CHEMIGUM is now available in a new lighter-weight bale and a lighter color for easier handling and wider compounding possibilities.

CHEMIGUM was among the first of the synthetic rubbers. Constant improvement also places it among the finest. Many manufacturers have found that CHEMIGUM permits the production of better, oil-resistant rubber goods faster and more profitably. Details on how CHEMIGUM can help you are freely available from the greatest supplier of synthetic rubbers and related resins by writing to:

Goodyear, Chemical Division, Akron 16, Ohio

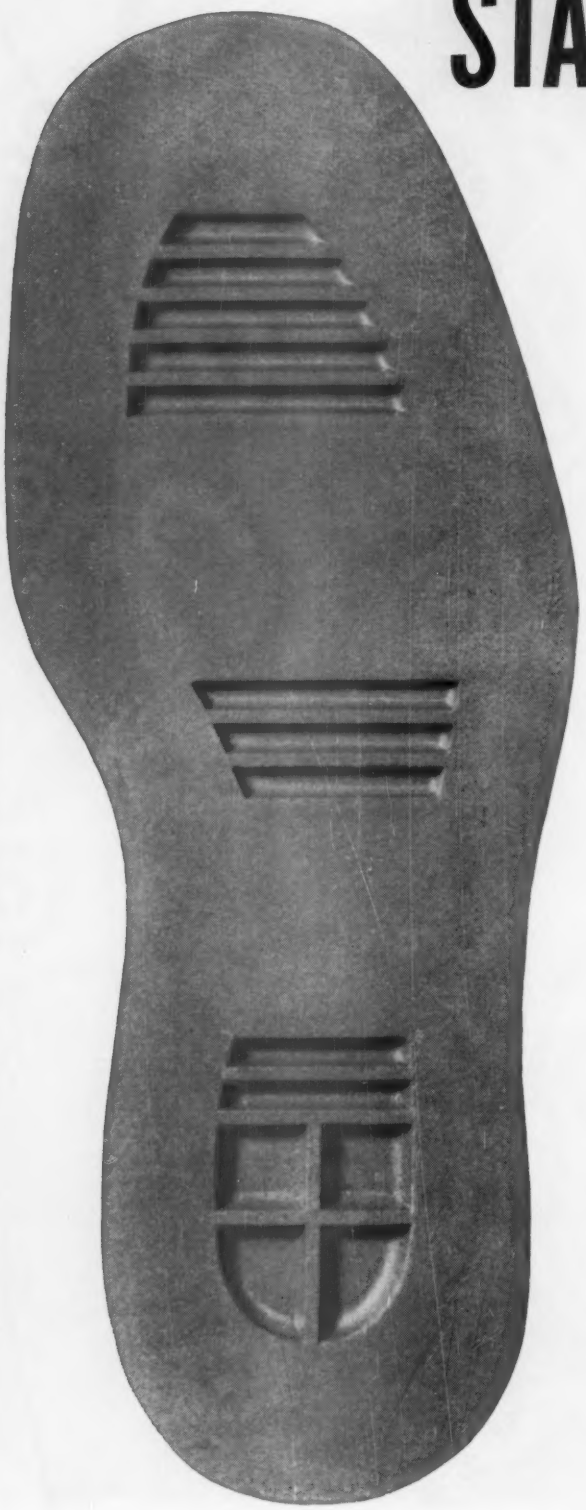
CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products—CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS—The Finest Chemicals for Industry

HELPING HANDS for chemical workers that stay on the job longer are these heavy-duty gloves of CHEMIGUM — the easy-processing nitrile rubber. They are made by multiple dipping solution of rubber cement onto the porcelain forms. Photo courtesy Charleston Rubber Company, Charleston, S. C.

MILLIONS OF SOLES SAVED BY STAYBELITE® RESIN



Rejects are lost soles, but by providing better control over the production of conventional and expanded rubber soling, Hercules Staybelite Resin can help keep your reject ratio to a minimum.

Staybelite gives a stringy kind of tenacity to uncured and semi-cured rubber which provides improved control over processing. And its pigment dispersing ability means more starting points, more uniform cell structure, and more "blow" with a given amount of gas-producing material.

Staybelite's resistance to oxidation, its pale color, and lack of odor make it ideal as a processing aid for all types of soling and heels. In some cases, the presence of Staybelite in the formulation materially reduces objectionable odors caused by other necessary materials.

For information on the diversified uses of Staybelite Resin in rubber compounding, write for technical booklet.

Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
918 Market Street, Wilmington 99, Del.

IR54-2

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

- **Accuracy to close Tolerances**
- **Durability**
- **Genuine Understanding of the problems of rubber goods manufacturers**

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.

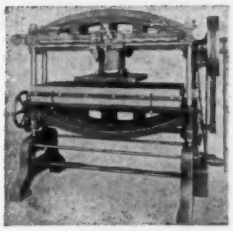
STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.



STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.

ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

SERVICE—One to three day service on dies.

DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.

Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

SAME DAY SERVICE

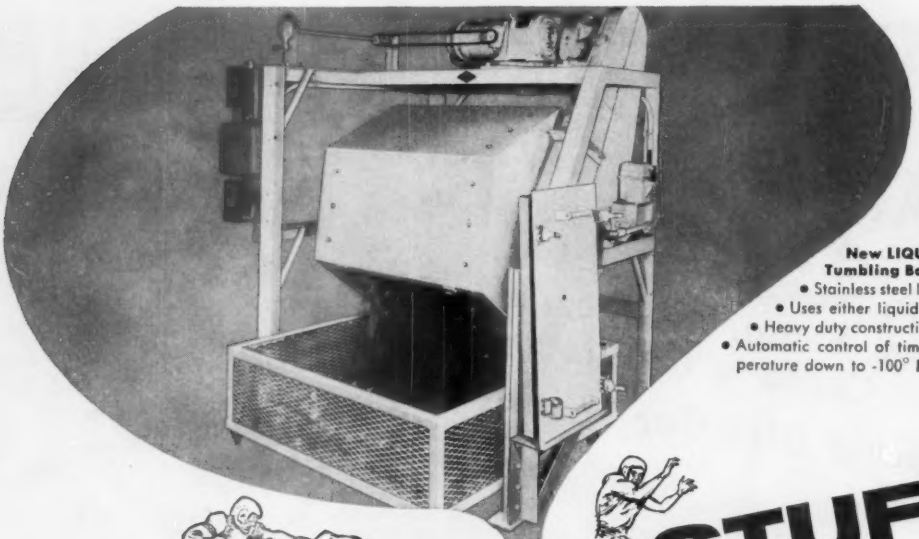
ACCURATE

STEEL RULE DIE MANUFACTURERS

24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 23 Years

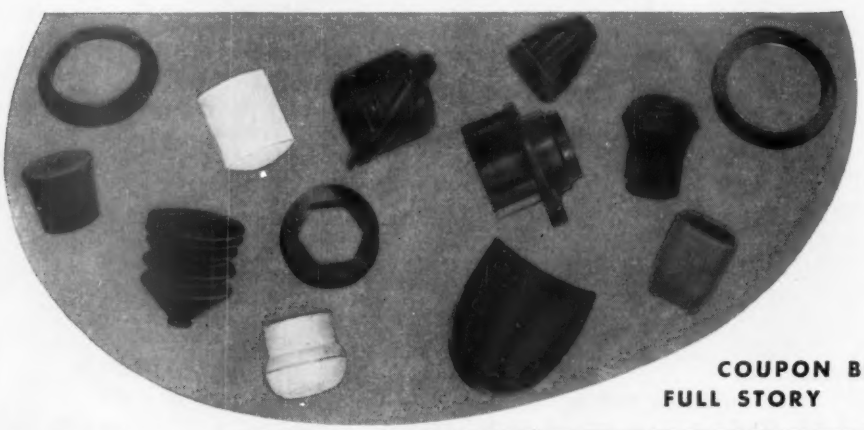


New LIQUIMATIC Rubber Tumbling Barrel

- Stainless steel lining, 3" Rubatex insulation.
- Uses either liquid CO_2 or Dry Ice.
- Heavy duty construction throughout.
- Automatic control of time and temperature down to -100° F.

NO ROUGH STUFF!

Want smooth, flashing-free rubber products? Want them in less time, at lower cost? Then you need the new LIQUIMATIC CO_2 Rubber Tumbling Barrel. Wholly new in design and operation—it's the most efficient machine of its kind ever made. Engineered and manufactured by The LIQUID CARBONIC Corporation—world's largest producer of CO_2.



COUPON BRINGS FULL STORY

For any CO_2 application

Liquid

RED DIAMOND CO_2 . . .
Solid (Dry Ice) or Liquid

THE LIQUID CARBONIC CORPORATION
3102 S. Kedzie Ave., Chicago 23, Illinois

Please send me full information on the new LIQUIMATIC Rubber Tumbling Barrel.

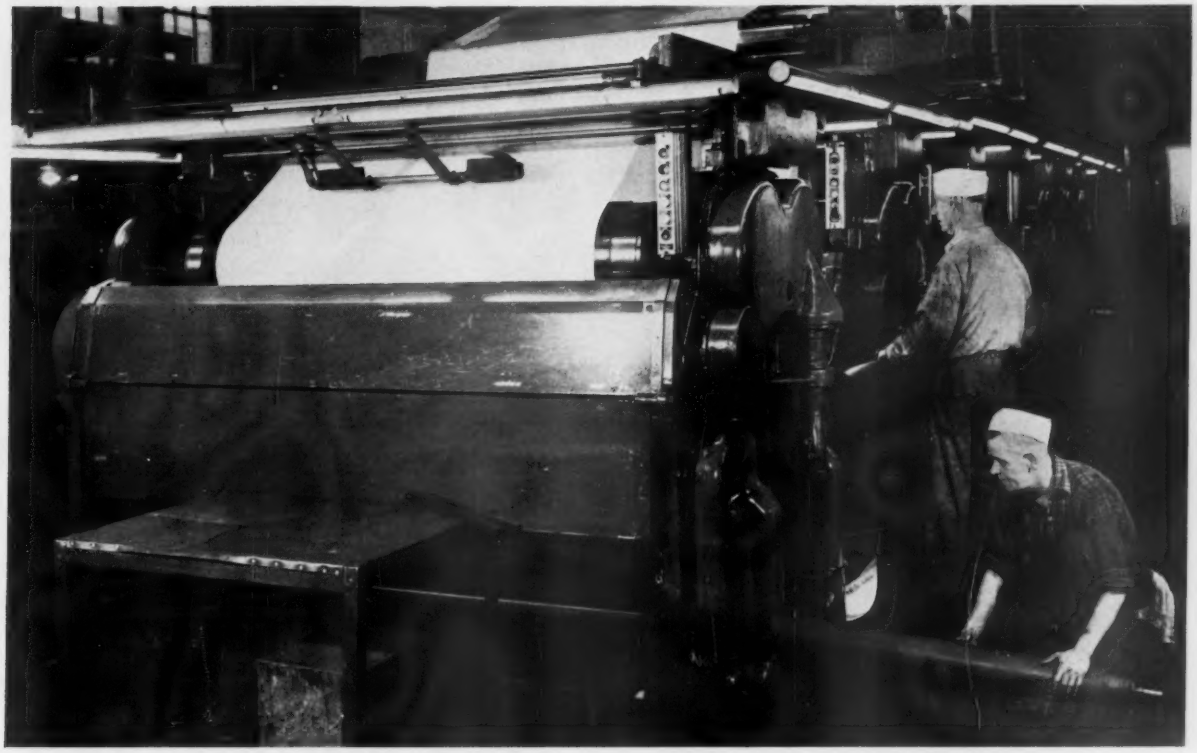
Name_____

Company_____

Address_____

City_____ Zone____ State_____

BEST "DRESS" FOR ANY PRESS are those press blankets, rollers and cutting rubbers made of CHEMIGUM—first, now finest, of the nitrile rubbers. These vital parts help the printer to meet his deadlines with the highest-quality printing.



MAKE YOUR BEST IMPRESSION

with printers' supplies made of CHEMIGUM

MAKING the best impression in print can be a real problem, when it comes to the rubber accessories on a press. Powerful ink and cleaning solvents, oils and greases, a surprising amount of heat and abrasion plus constant thumping, stretching or flexing can make printers' devils in reverse out of blankets, rollers and cutting rubbers.

Answer to the problem for a number of manufacturers is to make these printers' supplies of CHEMIGUM—the easiest-processing of the nitrile rubbers. CHEMIGUM is easily and economically compounded into faster-curing, stronger, longer-wearing, heat-, oil- and solvent-resistant products that give the printer sharp, clean impressions and much longer mileage.

If you are faced with problems in turning out oil-resistant rubber goods on time, on "spec" and at a profit, why not check into CHEMIGUM—product of one of the first and foremost manufacturers of synthetic rubbers and related resins. Details, samples and technical help are yours by writing to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

of special interest
to manufacturers
of rubber thread...
the new

ANTIOXIDANT 425*

. . . tailored to meet the specific needs of those whose rubber products require the ultimate in balanced protection against oxidation, and maximum freedom from discoloration.

Send for Technical Bulletin on Antioxidant 425 . . . today.

*Trade-mark

Calco®

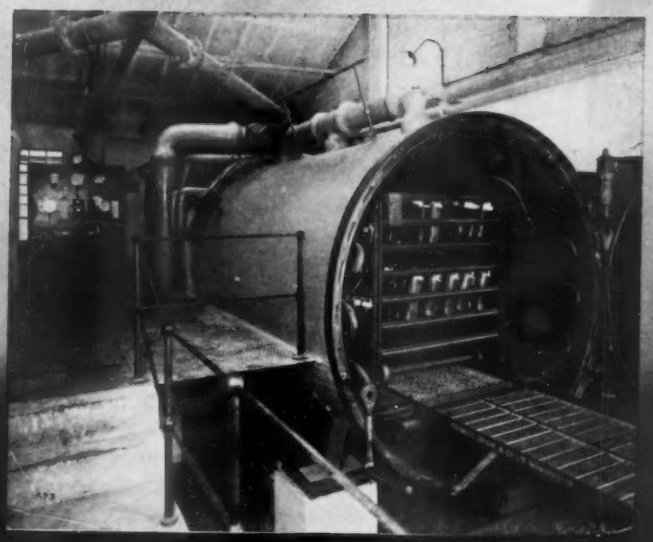
AMERICAN Cyanamid COMPANY
INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS:
Akron Chemical Company, Akron, Ohio
H. M. Royal, Inc., Trenton, N. J.
H. M. Royal, Inc., Los Angeles, Calif.
Ernest Jacoby and Company, Boston, Mass.
Herron & Meyer of Chicago, Chicago, Ill.
In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

all steamed up

We make a complete range of pans
for open steam cure,
Double based, Hot Air and Air Circulation,
covering General Mechanicals, Hose, Cable, Boots,
Shoes and other applications.

Available in any size
up to 9 ft. internal diameter
by any length to suit
customers' requirements.



The photograph
shows
a horizontal shoe pan
arranged for the continuous
circulation of pre-heated air.

SHAW

FRANCIS SHAW & COMPANY LIMITED MANCHESTER 11 ENGLAND

COOKE COLORS

A New Color Dispersion for

- Butyl Rubber
- Polyethylene
- Vinyls

Announcing a completely new color dispersion system!

Our "1000 Series" solves the problem of coloring Butyl Rubber. Complete dispersion of compatible colors in a compatible vehicle eliminates pin holes, streaking, crocking, and migrating. Color stable in all cures, permanent in both full tones and tints.

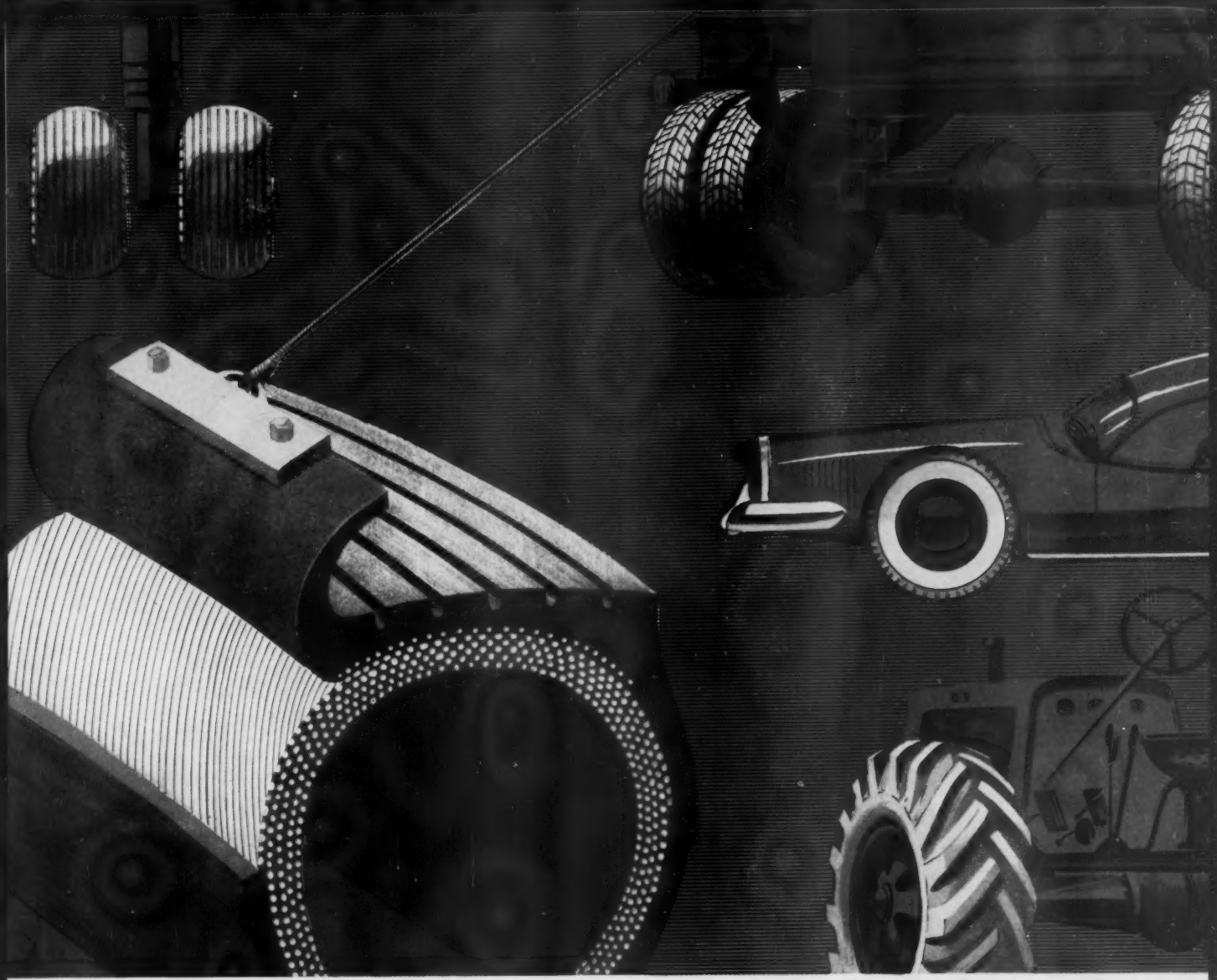
Dispersions are available for Vinyl and Polyethylene. Our one vehicle system eliminates the necessity of duplicate inventory of color for Vinyl and Polyethylene . . . one dispersion takes care of both, increasing calender release of vinyl stock . . . opaque enough to overcome changing color of copper for polyethylene wire stocks.

Exact color control for ease in color matching.

Send us your color problem . . . our laboratory offers prompt exact color matching to meet your every requirement.

Write now for samples and further information.

COOKE COLOR & CHEMICAL CO.
GLEN ROCK, NEW JERSEY
Telephone: GIlbert 5-6722



Up to 50% greater adhesion! *with* Pyratex

A tire's no tougher than the bond of cord to rubber. And new Pyratex, Naugatuck's special vinyl pyridine latex for tire cord treatment increases that bond up to 50%!

NEW PYRATEX . . .

- **secures rubber to fabric with a grip *stronger* than the stock itself**
- ***keeps* its outstanding adhesion even under high speed flexing and severe heat**
- **develops its adhesion more rapidly with cure**
- **greatly reduces "curing blows"**
- **has a higher solid content, for more convenient use**

Try Pyratex with your own stocks for automobile, truck, bus, and airplane tires, for V-Belts and conveyor belts, *wherever* you need the strength of reinforced rubber without fatigue resistance and ply separation problems.

Developed by the same company that brought you the first natural latex for tire cord treatment, the first reclaim dispersion, and then GR-S plus Resorcinol, Pyratex is available for further compounding, or as a Lotol—custom-compounded and ready for use.

To find out more about how Pyratex can improve *your* rubber products, economically, write on your letterhead to the address below.

50th ANNIVERSARY 1904 1954 NAUGATUCK CHEMICAL

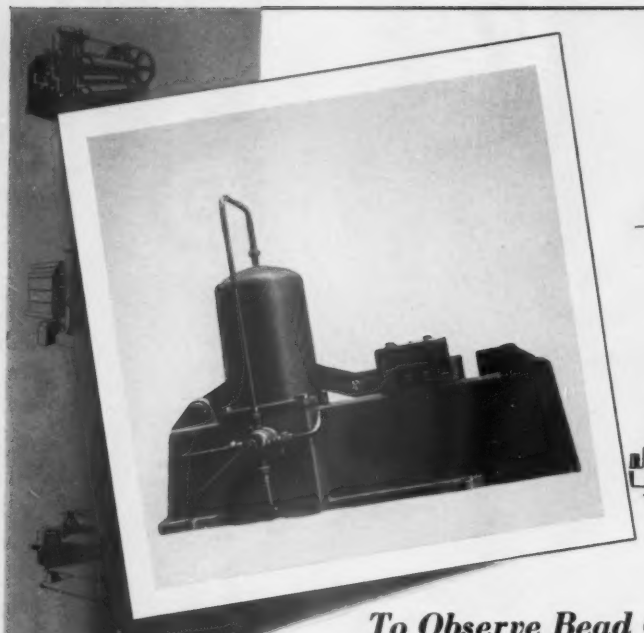
Naugatuck Chemical

1011 ELM STREET
NAUGATUCK, CONN.

Division of United States Rubber Company

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • IN CANADA: Naugatuck Chemicals, Elmira, Ontario

RUBBER CHEMICALS • SYNTHETIC RUBBER • PLASTICS • AGRICULTURAL CHEMICALS • RECLAIMED RUBBER • LATICES



To Observe Bead Construction and Prepare Clean Tire Sections For Your Dealers

USE OUR HEAVY DUTY BEAD CUTTER!

The machine illustrated operates on 150 to 225 lbs. air pressure. It will effortlessly and cleanly cut all types of beads including the heaviest triple cable types. Both the fixed cutter in the anvil and also the moving chisel are made of high-speed steel. The chisel is mounted in a holder which operates in massive guides. The aircylinder and the toggle system move it towards the anvil. The machine will cut 600 beads in eight hours.

If you are in need of a machine or an item of special equipment, if you intend expanding your facilities or plan entering new fields of manufacture, consult us first. We supply all types of machinery and equipment for every requirement of large and small factories.

Integrated Service provides complete design, layout and construction supervision for rubber, plastics and chemical plants, process engineering, technical service and raw material sources.

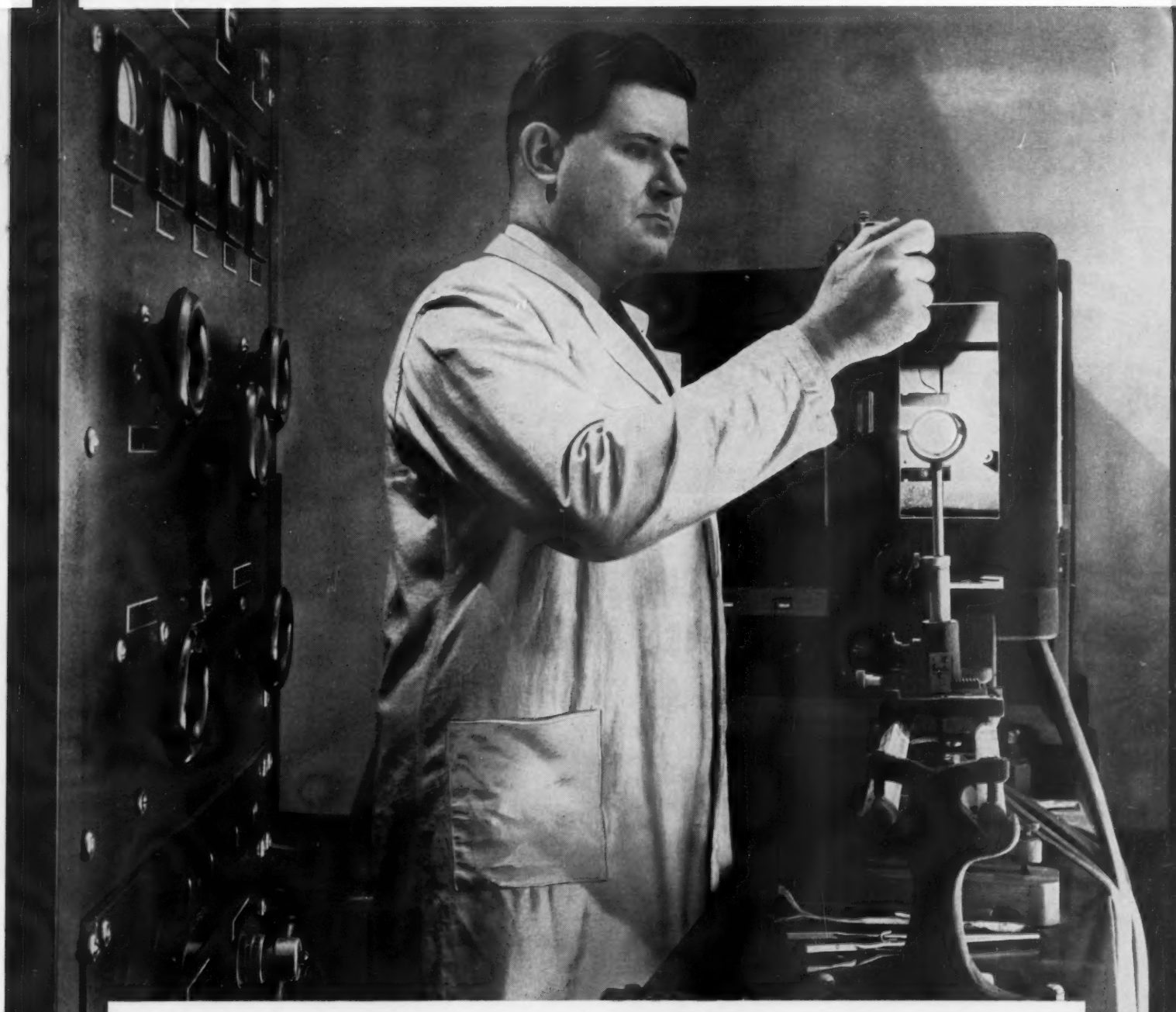
Continental Machinery Company, Inc.

AND

ASSOCIATED ENGINEERS AND ARCHITECTS

261 BROADWAY, NEW YORK 7, N. Y.

TELEPHONE: WORTH 2-1650 • CABLE: "CONTIMAC" NEW YORK



Portraits of impurities-taken 32 times faster!

Impurities in pigments are now measured in the Glidden laboratories in one hour on the emission spectrograph, as compared with the three or four days it required through chemical analysis. Here is another example of how Glidden uses every modern means to insure uniformity and outstanding quality in its pigments. The time saved permits research technicians to devote more hours to other important quality control projects which insure you of the finest in ZOPAQUE Titanium Dioxides; CADMOLITH Reds and Yellows; or SUNOLITH Lithopones.

THE GLIDDEN COMPANY

Chemicals • Pigments • Metals Division

Baltimore, Maryland • Collinsville, Illinois • Hammond, Indiana • Scranton, Pa.

CHEMICALS
PIGMENTS
METALS

QUALITY
Glidden
PRODUCTS

WHITE MOLDINGS PROVE DOW CORNING RELEASE AGENTS KEEP MOLDS CLEAN . . . *cut costs 80%*

Inspector Mike used to fill the scrap bins when white or light-colored parts were running. But Moe Muscles has put an end to all that with Dow Corning silicone release agents. Brilliantly clean and free from surface blemishes, even white parts leave the mold unstained by carbonized lubricants or mold dirt.

That's because Dow Corning silicone mold lubricants can't break down to form a carbonaceous deposit on mold surfaces. Molds stay clean 5 to 20 times longer than they do with ordinary release agents. Sharp detail, closer tolerances and high surface finish are assured — even on heavily loaded stocks. And mold maintenance costs are reduced by as much as 80%.

For easier release, lower production costs, improved quality and better appearance, specify Dow Corning silicone release agents: fluid for green carcass, bead and parting line release; emulsions for molds, mandrels and curing bags.

first in silicones

DOW CORNING CORPORATION
MIDLAND MICHIGAN

DOW CORNING SILICONES

ATLANTA CHICAGO CLEVELAND DALLAS DETROIT LOS ANGELES NEW YORK WASHINGTON, D.C. (SILVER SPRING, MD.)
CANADA: DOW CORNING SILICONES LTD., TORONTO ENGLAND: MIDLAND SILICONES LTD., LONDON FRANCE: ST. GOBAIN, PARIS

New Silicone Rubber Gum Can Be Sulfur Vulcanized; Blends Give Organic Rubber More Stability

Rubbery parts with properties intermediate between those of silicone rubber and organic rubbers can now be produced by compounding with a new silicone polymer that can be vulcanized with sulfur and blended in any proportion with organic rubbers.

Identified as Dow Corning 410 Gum and available now in commercial quantities, this new polymer can be blended with or applied as a protective coating to extend the serviceable temperature limits and the weather resistance of organic rubbers. Brittle point in the range of —70°F and usefulness at temperatures up to 400°F can be realized by proper blending. The physical properties of the blend will fall between those of high strength silicone rubber and the organic rubber constituent.

Dow Corning 410 Gum can also be blended with oil resistant rubbers to increase their stability in contact with hot oil. Such blending also markedly improves the ozone and weather resistance of organic rubber.

Tested in an atmosphere created by an ozone generator, for example, a Buna N type rubber, compounded for test purposes, showed failure cracks in less than 30 minutes. Under the same conditions, a fifty-fifty blend of the same organic elastomer and Dow Corning 410 Gum, compounded with the same fillers and vulcanizer showed no cracks after more than 8 hours.

Priced in the same range as standard silicone rubber gums, Dow Corning 410 Gum is currently available for immediate shipment in commercial quantities. Experimental samples for testing and evaluation are available on request.

For more information **WRITE TODAY!**

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich., Dept. CM-23

Please send me:

☐ Technical data on Dow Corning Mold Release Agents

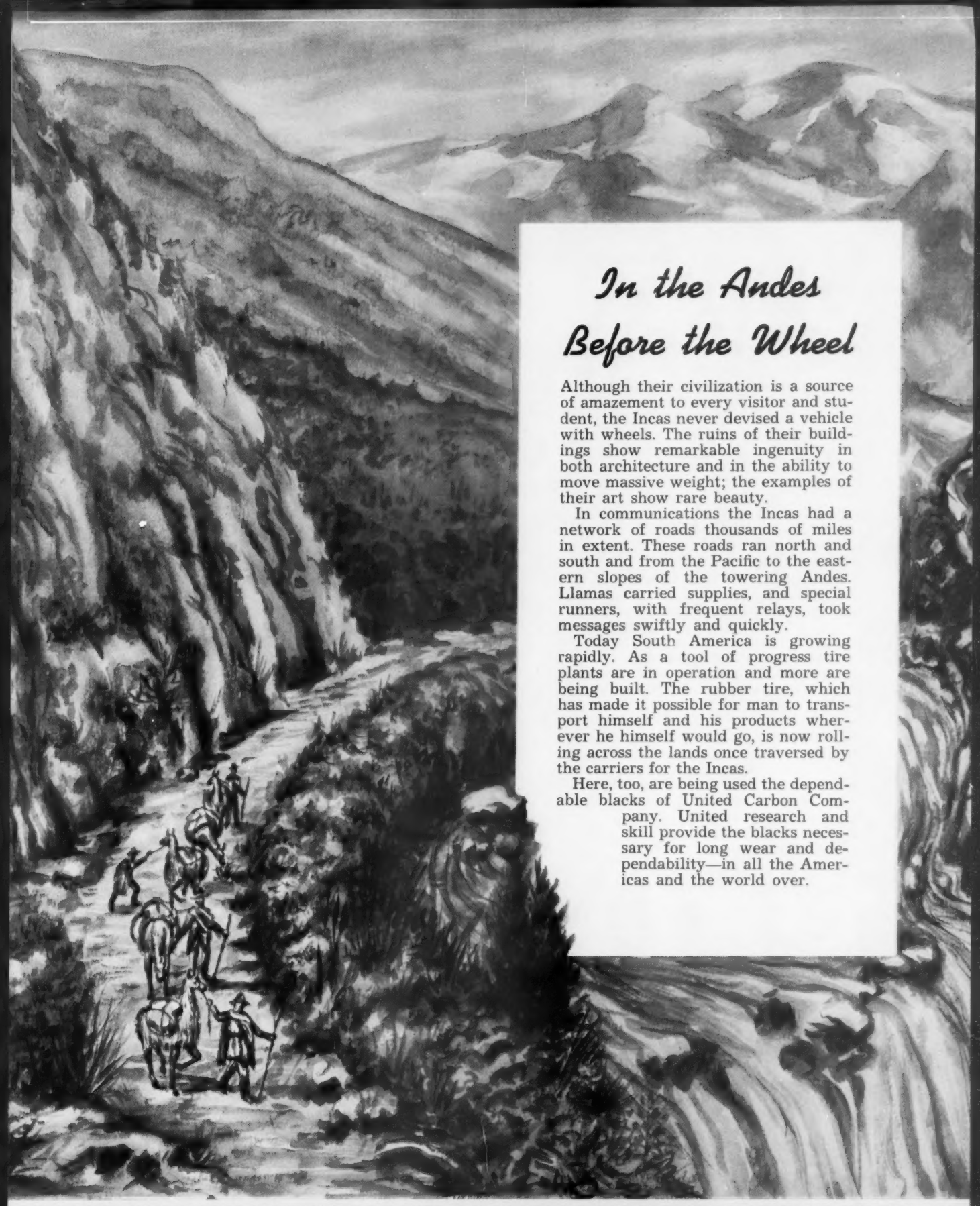
☐ Data and sample for Testing and Evaluating Dow Corning 410 Gum

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____



In the Andes Before the Wheel

Although their civilization is a source of amazement to every visitor and student, the Incas never devised a vehicle with wheels. The ruins of their buildings show remarkable ingenuity in both architecture and in the ability to move massive weight; the examples of their art show rare beauty.

In communications the Incas had a network of roads thousands of miles in extent. These roads ran north and south and from the Pacific to the eastern slopes of the towering Andes. Llamas carried supplies, and special runners, with frequent relays, took messages swiftly and quickly.

Today South America is growing rapidly. As a tool of progress tire plants are in operation and more are being built. The rubber tire, which has made it possible for man to transport himself and his products wherever he himself would go, is now rolling across the lands once traversed by the carriers for the Incas.

Here, too, are being used the dependable blacks of United Carbon Company. United research and skill provide the blacks necessary for long wear and dependability—in all the Americas and the world over.

UNITED CARBON COMPANY, INC.

KOSMOBILE S-66 (MPC) AND KOSMOBILE 77 (EPC) are two blacks of great distinction. They are gas base, channel process blacks, free from processing difficulties and recognized as bulwarks of strength in any rubber. They build up less heat and have good flex life.

KOSMOBILE S-66 AND KOSMOBILE 77 are quality blacks of outstanding uniformity and dependability. Their balanced properties ease many compounding and service problems.

Standardize on United blacks for better results and product leadership.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS

Means Lower Cost Tire Molds

Economical tire mold manufacture requires special techniques, special tools and tooling. Accordingly, when we consolidated all our tire mold manufacturing in our Athens Machine Division Plant, we installed special purpose equipment built to produce tire molds only. Many of these machines are of our own design.

This adequate and balanced line of equipment devoted to a single purpose makes possible savings in production costs and production time of real importance to tire manufacturers.

Our Athens Machine Division is a completely self-contained tire mold manufacturing plant — the only plant in the world, we believe, devoting itself exclusively to the manufacture of tire molds.

1693

ATHENS MACHINE DIVISION
THE BRIDGWATER MACHINE COMPANY
Akron, Ohio

FOR BETTER MOLDS FOR BETTER TIRES *SPECIFY* BRIDGWATER

For WHITE SIDEWALLS that STAY white!

Use "non-staining" BUFFALO RECLAIMS in your tires

The trend is definitely to more and more white sidewall tires for today's modern cars. The only trouble is that, as a manufacturer, you have to face up to higher costs all along the line. That's when new improved Buffalo Reclaims can help you out of plenty of production problems.

For instance, our new #220 can help you produce a BETTER white sidewall tire at a reasonable cost. As you well know, when ordinary reclaims are used, a "bleeding" process many times "stains" the white sidewall even before your dealer can sell it. We've licked that bugaboo with conventional process #220 . . . a specially developed reclaim that completely eliminates this nightmare for manufacturers.

In addition, we also have Reclaimator Process Reclaim #R-400 with the same characteristics. Drop us a line now, for the latest report!

Always keep reclaims in your formula and always look to Buffalo for the best. U. S. Rubber Reclaiming Company, Inc., P. O. Box 365, Buffalo 5, N. Y. Trenton agent: H. M. Royal, Inc., 689 Pennington Ave., Trenton, N. J.

71 years serving the industry solely as reclaimers

U.S. RUBBER RECLAIMING COMPANY, INC.

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Stauffer has offered *special* Rubbermaker's Sulphurs for over three decades, constantly improving the fineness and surface properties to meet the demands of modern rubber technology. In addition, Stauffer has pioneered the commercial production of "insoluble sulphur" to prevent blooming prior to vulcanization.

Plants, offices, and warehouses coast-to-coast assure prompt handling of your requirements.

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Caustic Soda • Carbon Tetrachloride • Carbon Disulphide
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SULPHURS—Crystex®—85% "IS" • Tire Brand—99.5% Pure
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Stauffer CHEMICALS SINCE 1885

STAUFFER CHEMICAL COMPANY

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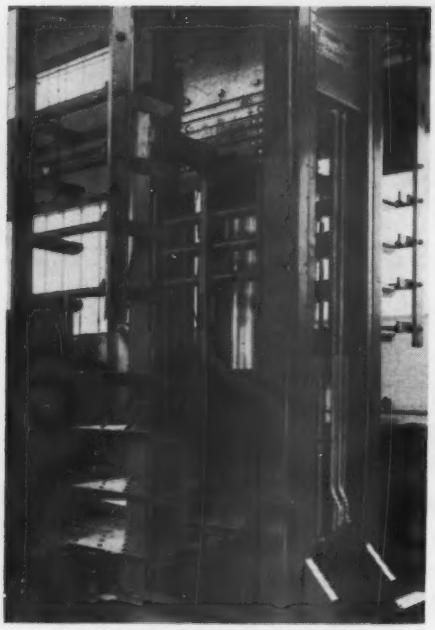
Assembly of one of the larger presses for making conveyor belts and matting.



Multiple loading device for greater efficiency — increased production.

Since 1883 Siempelkamp, with all the Old World engineering ingenuity, has been building hydraulic presses and related equipment for rubber and plastics manufacturers all over the world. Machines and control panels, from the smallest to the largest, made to your specifications.

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Now! Hot Stretch your Nylon Tire Cord

at

CONSTANT *Temperature*
CONSTANT *Time*
CONSTANT *Tension*
VARIABLE *Line speeds*

IOI's *new* ROLLEVATOR OVEN* *eliminates need of continually balancing 3-T's... enables you to set for optimum results and keep them constant*

THE ROLLEVATOR OVEN is an achievement accomplished by IOI as the result of more than four years of engineering and construction of full width, high tension equipment for dipping and hot stretching nylon fabric. It takes the 3 T's out of the category of variables and makes them constants. No longer must the 3 T's be continually balanced. Now you can hot stretch nylon at *constant* temperature, *constant* time and *constant* tension at *any* line speed.

Fast or slow, start-up or shutdown, the oven temperature is always the same—no more costly cold-air purges for shutdowns—no more elaborate control equipment—no reason for varying the oven temperature. There is but one temperature that is best for stretching nylon fabric and the Rollevator Oven enables you to set for that temperature and forget about it from that point on!

What about time? With temperature constant, hot stretch exposure time can not vary with line speed. The unique design of the Rollevator Oven automatically insures that each and every yard of fabric is hot stretched for the same length of time at the optimum temperature, at any line speed.

Tension, the third vital quality factor, is also held constant in this Industrial Ovens system. More closely so and at higher limits than ever before, because of improved design in the hold back and pull roll stands.

*Trade Mark

*Patent applied for.

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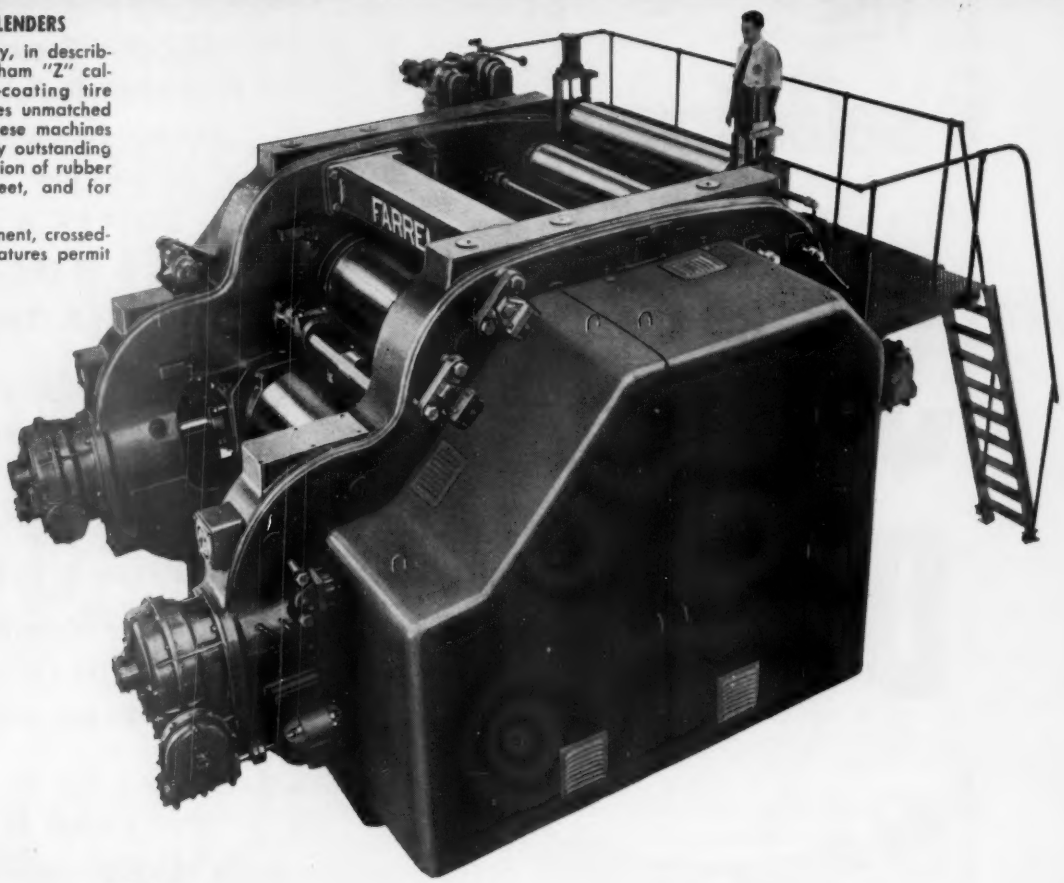
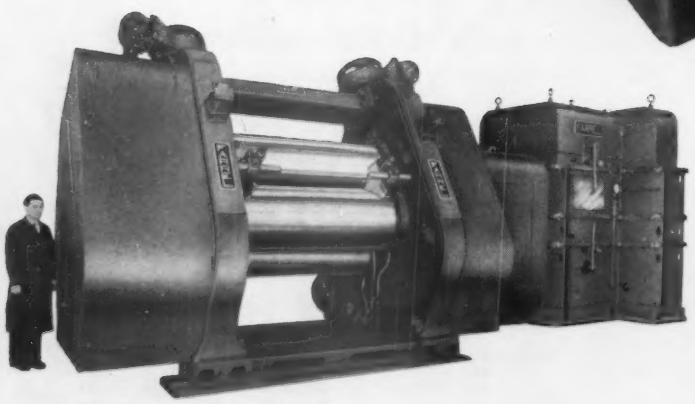
Bring your Calendering Problems to FARREL-BIRMINGHAM®...

FOUR-ROLL "Z" CALENDERS

A leading rubber company, in describing its new Farrel-Birmingham "Z" calender train for double-coating tire fabric, says that it "insures unmatched uniformity of quality". These machines have proved to be equally outstanding for the high-speed production of rubber and plastic film and sheet, and for single coating.

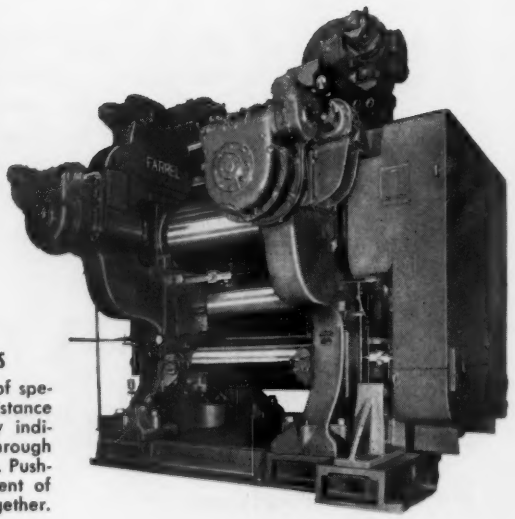
Their unique roll arrangement, crossed-axes device and other features permit full control of gauge.





THREE-ROLL TRI-ANGULAR CALENDERS

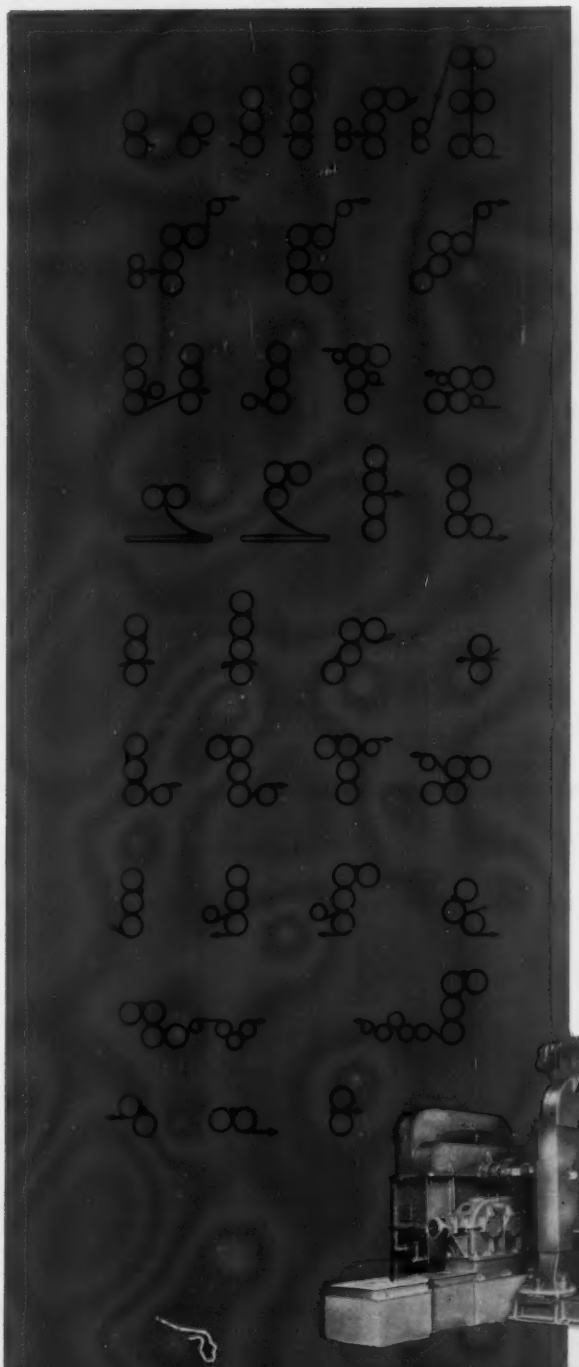
The machine of the future for any type of production requiring two calendering passes. Right-angle arrangement of rolls provides closer control of gauge and easier feeding conditions.



FOUR-ROLL L-TYPE CALENDERS

This 28" x 66" plastics calender is of specially heavy construction for high resistance to deflection. Roll adjustment is by individual motor driving each screw through high-ratio reduction worm gear units. Push-button control provides for adjustment of either roll end separately or both together.

. ."Calender Headquarters" since 1854



Since that time, a century ago, Farrel-Birmingham has maintained world-wide leadership in calender design and pioneered many improvements.

Of particular importance are the two most recent developments —the four-roll "Z" calender and the three-roll "Tri-angular" calender. Both of these machines have established new standards for accuracy and economy.

All of the calenders represented by the 34 diagrams shown here have been built by Farrel-Birmingham time and again. As a result, you can be almost certain that the basic design for the "specialized" machine you require has already been worked out by Farrel-Birmingham engineers and proved on the job.

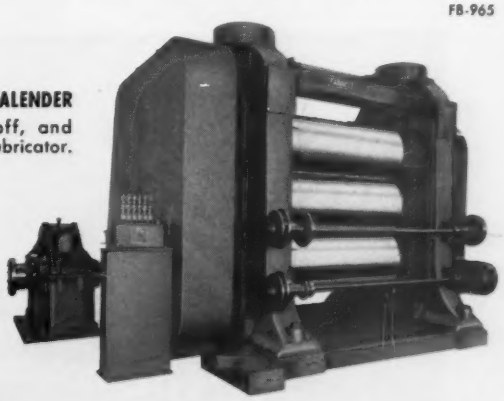
But this does not mean that the calender you buy will be an off-the-shelf machine. To the contrary, physical proportions, materials, type of construction, lubrication system, gearing, special operating features—in fact, every detail of every calender is designed for a specific job.

Before you decide on a calender, call in a Farrel -Birmingham engineer. With the experience of "Calender Headquarters" behind him, he will be able to find a solution to your calendering problems. Send for bulletin 174 which describes F-B® calenders in detail.

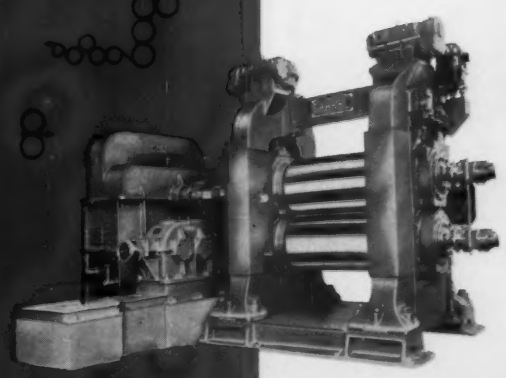
FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

FB-965



24"x68" THREE-ROLL CALENDER
showing windup, let-off, and mechanical force-feed lubricator.



30" x 54" TWO-ROLL ASPHALT TILE CALENDER
Proportioned for great strength and resistance to deflection. Rolls are drilled beneath the chill for more effective temperature control. Gearing is enclosed in a separate Uni-drive and connected to the rolls by universal spindles.

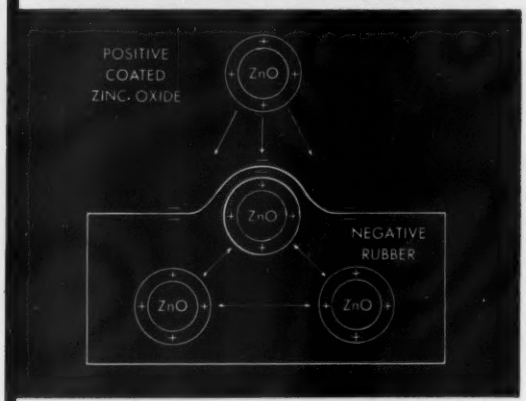
Farrel-Birmingham®

FROM 8 TO

85 CUSTOMERS

IN 5 YEARS

above: Graphic illustration of the hydrophobic nature of the surface treatment given all St. Joe coated Zinc Oxides which indefinitely resist wetting when placed in contact with water. This unique property of St. Joe coated Zinc Oxides guarantees to the consumer maximum resistance to moisture absorption during storage.



above: The monomolecular film or hydrophobic, high molecular weight organic ester on St. Joe's coated Zinc Oxide has a more positive charge than that of rubber. Thus, the rubber has a greater affinity for St. Joe's coated Zinc Oxide than for uncoated pigment with consequent reduction in incorporation time. The repelling force of the positively charged film on the zinc oxide particles themselves gives improved dispersion in less time by preventing agglomeration.

that's the success story of

ST. JOE coated ZnO

ST. JOSEPH LEAD COMPANY
ST. JOE
ZINC OXIDE
JOSEPHTOWN, PA.

BLACK LABEL #20-21
Fine Particle Size

GREEN LABEL #42-21
Medium Particle Size

Do what 85 other rubber manufacturers have done—make a factory test and prove to yourself these advantages of St. Joe coated Zinc Oxides:

1. Moisture resistant
2. Faster incorporation
3. Better dispersion
4. Increased mixing capacity
5. Lower power consumption
6. Lower mixing temperature
7. Reduced storage space

note: All St. Joe Zinc Oxides may now be shipped as space-saving Unit-Loads. Our 6-page illustrated folder, containing detailed operating data on the St. Joe Unit-Load method is yours for the asking.

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Plant & Laboratory: Monaca (Josephtown) Pa.

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NONtoxic

by F.D.A.*

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  di-iso-octyl phthalate
- Cabflex® DOP
  di-2-ethylhexyl phthalate
- Cabflex® ODP
  iso-octyl decyl phthalate
- Cabflex® DDP
  di-decyl phthalate
- Cabflex Di-OA®
  di-iso-octyl adipate
- Cabflex® DOA
  di-2-ethylhexyl adipate
- Cabflex® ODA
  iso-octyl decyl adipate
- Cabflex® DDA
  di-decyl adipate
- Cabflex® Di-OZ
  di-iso-octyl azelate
- Cabflex Di-BA®
  di-iso-butyl adipate
- Cabol 100
  hydrocarbon oil plasticizer

Cabot produces the nontoxic plasticizer Cabflex Di-BA and does not make the finished film.

* Nontoxic means "suitable" for use in food packaging materials.

"Suitability means that under the conditions of use, and in the amounts now employed to produce a finished film, di-iso-butyl adipate has such a low order of solubility as to be insignificant as a food contaminant when weighed in the light of the toxicological evidence." ". . . this plasticizer has had adequate pharmacological study demonstrating its harmlessness in the amounts now used in finished commercial films . . ."

Reprinted from Association of Food & Drug Officials of the United States Vol. XV, No. 3, July 1951

For product data sheets, further technical information and for samples, address

CABOT PLASTICS CHEMICALS DIVISION

GODFREY L. CABOT, INC.

77 Franklin Street, Boston 10, Mass.

An Important Announcement to Users of BANBURY MIXERS

INTERSTATE WELDING SERVICE

Banbury Rebuilding, Is Now A DIVISION Of

SKINNER ENGINE COMPANY, ERIE, PA.

ANNOUNCEMENTS BY:—

G. A. McLean, President
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"In the interests of ever better service to our customers we have consolidated all of Interstate Welding Service's Banbury rebuilding operations in the plant of Skinner Engine Company, Erie, Pennsylvania. Continuing now as a division of this outstanding engineering organization, Interstate's 21 years of specialized Banbury experience will combine more closely with Skinner Engine Company's traditional reputation *(since 1868)* for precision work. The result will be Banbury repair and rebuilding service second to none."

J. L. Skinner, President
SKINNER ENGINE COMPANY

"We are happy to welcome into our corporate setup, as a Division, the highly specialized Banbury rebuilding organization operating for the past 21 years as the Interstate Welding Service, organized and continuously headed by Gordon A. McLean. Although easing up to some extent in his direct work on Banburys, Mr. McLean's intimate personal knowledge of Banbury requirements will continue to be available to his customers. We confidently offer all Banbury users an unsurpassed repair and rebuilding service."

A NEW Address . . . A NEW Telephone Number

Now, more than ever, "Interstate-Rebuilt" means a better job for you in the restoring of your worn Banbury body to A-1 condition. Interstate "rebuilds" mostly with new parts. One of our engineers will inspect your Banbury installation at your request. Interchange your present body for one of ours, completely rebuilt, or use our "pre-plan" method to have your body rebuilt and returned. Either way YOU SAVE. We have now available, subject to prior sale, rebuilt bodies in sizes 3, 9, and 11, each with door and cylinder. MAKE A NOTE OF OUR NEW ADDRESS AND PHONE NUMBER, shown below.

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INTERSTATE WELDING SERVICE

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can bring better results with economy in YOUR Production thru . . . . .

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(VULCANIZED VEGETABLE OILS)

1. For processing aids to get better mixing, extrusion and calendering, and good dimensional stability in soft stocks . . .
2. For extending higher cost oil-resistant synthetic rubbers and to improve their rubber-like properties . . .
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RUBBER SUBSTITUTES can perform one or more of these 5 listed functions to give you better results with economy in your production . . . There are many grades developed to serve in many different types of compounds of natural, synthetic and reclaim rubbers — and to provide varying properties in the compounds. These vulcanized vegetable oils are non-thermoplastic, resilient solids which are readily dispersed in rubber compounds either by mill or Banbury. There are white grades for white or light colored products, brown grades for use in compounds where light color is not a factor, and in modified brown grades containing plasticizers and fillers.

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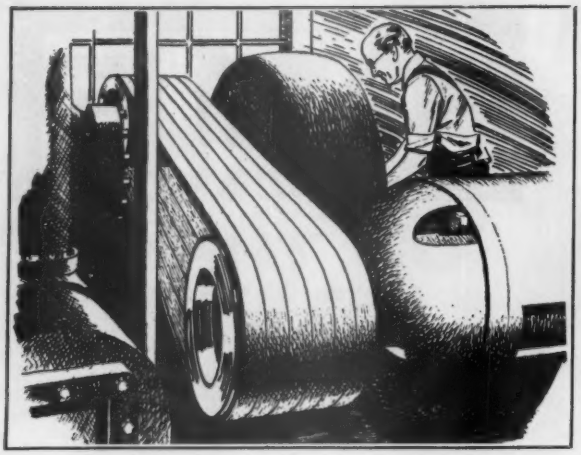
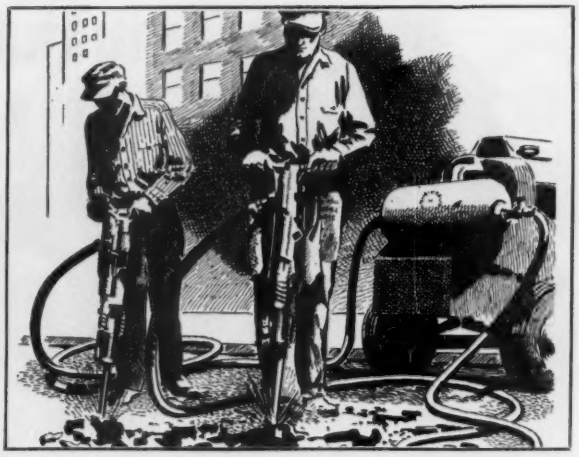


Wellington Sears has both cotton and synthetic fabrics to insure top performance and long life in products such as power transmission belts.



Shawmut Hose Duck is a soft, strong, plied-yarn fabric affording flexibility and good impregnation in a variety of hose applications.

YOU GET LONG SERVICE LIFE WITH WELLINGTON SEARS *BELTING DUCK*

Experienced industrial users specify Shawmut Belting Duck wherever exceptional strength, good adhesion, and bulking properties, *plus* economical cost, are needed, as in heavy-duty conveyor belts.

Product of an organization that has specialized in heavy-duty fabrics for over a century, this sturdy, pliable belting duck owes its strength to the carefully controlled construction and twist of the rugged plied yarns in the warp and filling.

With a complete line of cotton ducks for belting, hoses, and other mechanical rubber applications, Wellington Sears also has developed fabrics utilizing the unique properties of nylon, high-tenacity rayon, and other fibers.

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Write for your free copy of "Modern Textiles for Industry" which includes pertinent information on rubber applications. Address: Wellington Sears Co., Dept. L-3, 65 Worth St., N. Y. 13.

Superior Fabrics for the Rubber Industry

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- Sheeting
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★ NOVEMBER ★
NEWS BULLETIN

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INDUSTRIAL TIRE COMPOUNDS
INDONEX Plasticizers
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with natural rubber and GR-S-1502 give excellent resilience, abrasion and tear or chip resistance. With oil-extended GR-S-1708 give satisfactory low cost compounds.
See Circular 13-50

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Circular 13-50 and
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There's a **BIG DIFFERENCE** in Plasticizers, too!

NEW!

RC PLASTICIZER 0-16 DIFFERS FROM MOST FATTY ACID ESTER PLASTICIZERS IN POSSESSING:

1 Resistance to Oxidation and Rancidity!
2 Low Acidity!
3 High Degree of Water Insolubility!
4 Excellent Electrical Properties!

Now commercially available, RC PLASTICIZER 0-16 (ISO-OCTYL PALMITATE) is a saturated lubricant-type secondary plasticizer for Polyvinyl Chloride.

Specify RC PLASTICIZER 0-16 and you'll find a *big* difference if your product is one of the following:

Film and Sheeting — **Fabric Coatings**
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RUBBER CORPORATION OF AMERICA ALSO SUPPLIES THESE OUTSTANDING PLASTICIZERS:

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E-S	(AN EPOXIDIZED TRIESTER)	TG-9	(TRIETHYLENE GLYCOL DIPELARGONATE)
DIOA	(DI-ISO-OCTYL ADIPATE)	DOA	(DI-2 ETHYLHEXYL ADIPATE)
DIOS	(DI-ISO-OCTYL SEBACATE)	DOS	(DI-2 ETHYLHEXYL SEBACATE)
DBP	(DIBUTYL PHTHALATE)		
DIOP	(DI-ISO-OCTYL PHTHALATE)		

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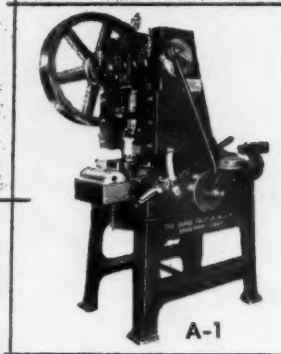
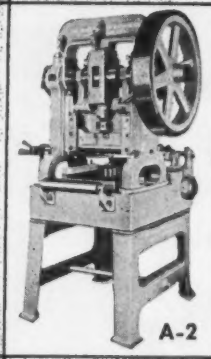

A-1

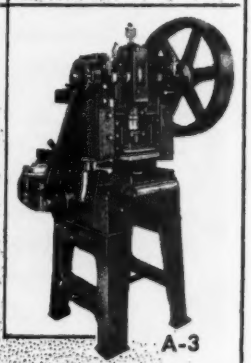
MODEL A-1
Cutting Heels at high speed production or short runs.


A-2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.


A-3

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coulter production machines
HAVE MEANT MORE IN HIGHER QUALITY CUTTINGS . . . MORE IN GREATER PRODUCTION.

the James COULTER Machine Co.
BRIDGEPORT, CONN.
BRIDGEPORT · CONNECTICUT

Close harmony

America's rubber industry is remarkable for the close harmony among research scientists, engineers, executives and production managers on many levels.

In just a few years this cooperation has completely transformed rubber technology.

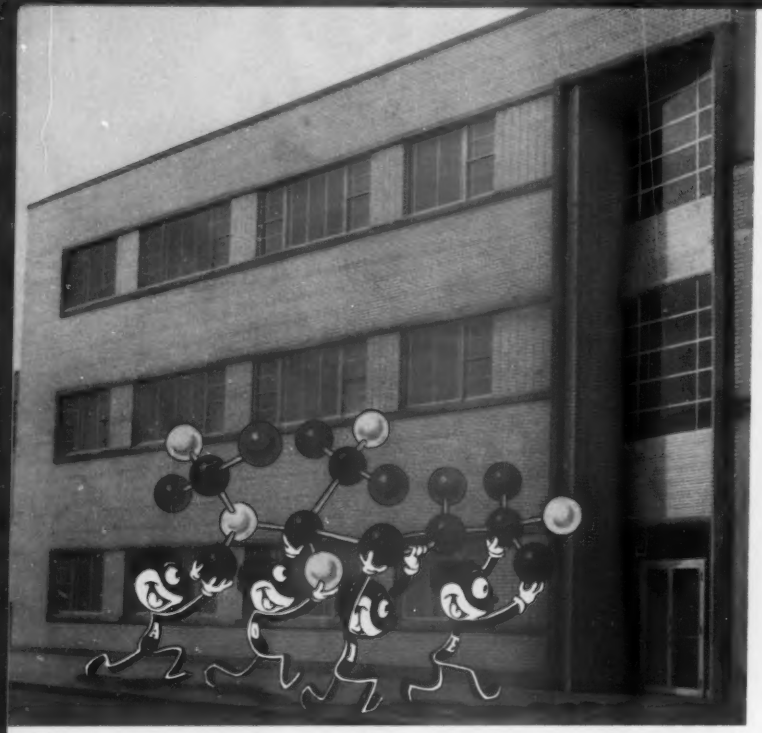
Equations jotted in laboratory notebooks have been pilot-tested, evaluated and built into efficient processing units.

Chemicals once available only by the gram at high cost are now produced by the ton at pennies per pound because these chemicals contribute in some way to the efficiency of a rubber compound.

Today the rubber industry is such a dynamic consumer of scientific results and research information that we want to tell you more about Philblack's background in pure and applied science.

Phillips 66

PHILLIPS CHEMICAL COMPANY *Philblack Sales Division*
A SUBSIDIARY OF PHILLIPS PETROLEUM COMPANY



PHILBLACK SALES SERVICE LABORATORY, 318 Water Street, Akron, Ohio, is widely known in the rubber industry as the repository of much of Phillips extensive background in the rubber compounding field. Satisfactory end use for the Philblacks is the goal of this laboratory which calls freely on other Phillips laboratories and pilot plants in Bartlesville, Oklahoma, and Borger, Texas.

Philblack* is one in 500,000

About half-a-million different petrochemicals can be synthesized from the molecular building blocks found in crude oil and natural gas.

From this vast array of possible products, Phillips research scientists selected an oil furnace black later known as Philblack for a thorough evaluation.

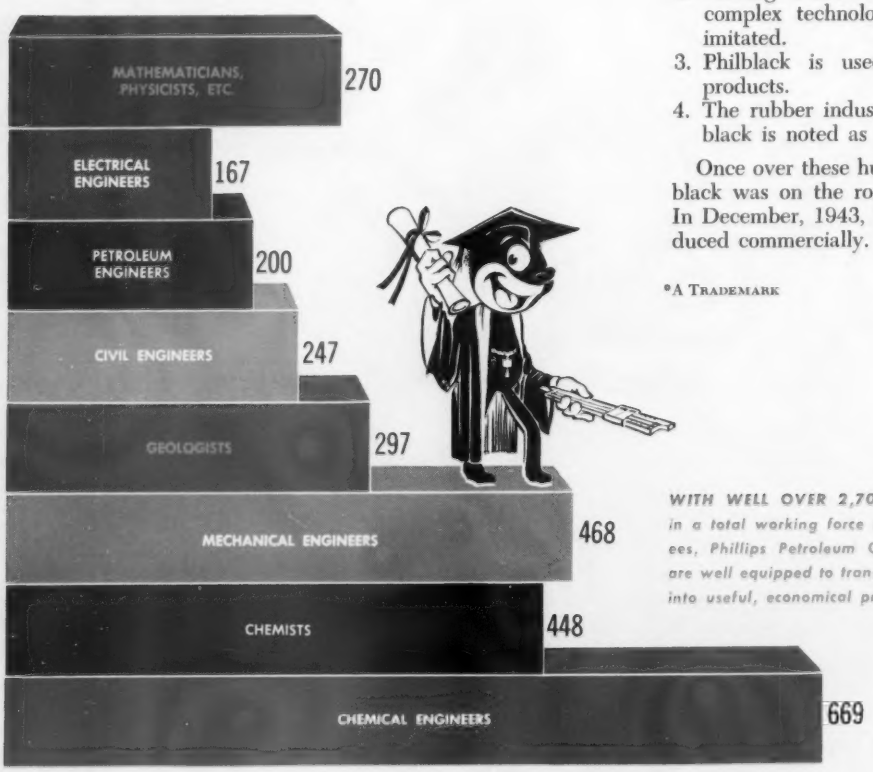
At that time, Philblack was little more than a gleam in the eyes of a few dedicated researchers. But Philblack had what it takes to meet the four requirements by which Phillips screens promising research ideas:

1. Philblack is based on petroleum raw materials.
2. Making Philblack involves difficult and complex technology which is not readily imitated.
3. Philblack is used in mass consumption products.
4. The rubber industry to be served by Philblack is noted as a growth industry.

Once over these hurdles, the first oil furnace black was on the road to commercial reality. In December, 1943, Philblack A was first produced commercially. Known as High Modulus

*A Trademark

ONE OF EVERY EIGHT PHILLIPS EMPLOYEES IS A TECHNICAL GRADUATE



***WITH WELL OVER 2,700 SCIENTISTS** and engineers in a total working force of more than 22,000 employees, Phillips Petroleum Company and its subsidiaries are well equipped to transform petroleum raw materials into useful, economical products such as the Philblacks.*

BEHAVIOR of highly reinforcing blacks in rubber is investigated from many angles in Phillips laboratories. Specific surface area and particle size have long been recognized as important factors in improving reinforcement. But to evaluate the influence of various physical properties that are almost completely interdependent requires a high level of scientific resource and ingenuity.

Furnace Black, Philblack A later took its present identification, Fast Extrusion Furnace.

"Well, that's that!" you might have expected our researchers to say as they embalmed Philblack A in research reports and went on to other matters.

But World War II was then upon us. The Philblack process offered such economies in steel, man power and raw materials that our research was continued with increased vigor.

In contrast to most chemical engineering development, Philblack research used full-scale commercial reactors. This is unusual. It calls for great skill. Operating costs on a full-scale "pilot" plant can reach incredible levels. Yet, by systematically studying combustion variables in a full-size unit, Phillips researchers accumulated data which translated readily into an entirely new High Abrasion Furnace black – Philblack O.

Introduction of Philblack O touched off an eightfold expansion in Philblack plant capacity. The rubber industry called for Philblack with such insistence that it was years before we could build up the Philblack inventories which are now maintained.

Following 1947, slide rules ran hot and heavy for many months as our chemical engineers designed and constructed the world's largest furnace black plant at Borger, Texas. With this pressure for production you might logically anticipate a let-down in research on carbon black.

Such was not the case. Phillips research reports of the period bristle with new ideas.

Higher structure . . . greater reinforcing potential . . . balanced with useful processing properties and realistic economics – such were our research goals in carbon black.

On October 6, just 2 years ago, the toughest carbon black ever marketed commercially came on the scene. Philblack E Super Abrasion Furnace, as this black is known, exhibits extreme resistance to abrasion. It sturdily withstands aging, cracking, cutting and chipping.

Most recently, Philblack I – Intermediate Super Abrasion Furnace black – has emerged from Phillips pilot plant. Philblack I combines superior abrasion resistance with the economic advantages of a less expensive black.

With four aces in hand – four Philblacks – you may wonder if our research still proceeds on carbon black.

Indeed it does.

New aspects of surface chemistry and solid state physics are being examined by critical and imaginative minds.

The more we learn about carbon-polymer interaction, the more Philblack will be able to help you of the rubber industry to deliver better rubber products at lower costs.

RADIOACTIVE SUBSTANCES are removed from the Materials Testing Reactor at Idaho Falls, Idaho, where Phillips research scientists manage and operate various activities for the Atomic Energy Commission. Although the functions at Idaho Falls are strictly classified, the testing function of this reactor is expected to develop design criteria for the use of materials under exposure to radioactivity.

Phillips research leadership pays off in consistent Philblack quality

typical properties	PHILBLACK A	PHILBLACK O	PHILBLACK I	PHILBLACK E
Particle size mean diameter, Angstroms	510	262	205	185
Surface area electron microscopy, square meters/gram	65	94	118	138
Surface area nitrogen adsorption, square meters/gram	46	82	123	142
pH	9.7	9.1	9.5	9.3
Volatile matter percent	1.13	1.13	0.79	2.17
Tint	120	174	187	202
Oil absorption cubic centimeters/gram	1.20	1.20	1.21	1.60
Iodine number milligrams/gram	45	85	133	158

When your problems concern carbon black and rubber, we'll be glad to give you the benefit of our long experience in research and service. To make the most of our unmatched background with carbon black and elastomers, be sure to consult your Philblack Technical Representative.

PHILLIPS CHEMICAL COMPANY

Philblack Sales Division • 318 Water Street • Akron 8, Ohio

Export Sales 80 Broadway, New York 5, N. Y. West coast representative: Harwick Standard Chemical Company, Los Angeles, California. Canadian representative: H. L. Blachford Ltd., Montreal and Toronto.

Warehouses: Akron, Chicago, Trenton, Los Angeles, and Toronto

Wanted . .

Sales Representative for Latex, Rubber and allied products.

An experienced man in this field, or one having a chemical or engineering background, will find this an unusual opportunity with an attractive future.

Write qualifications in initial letter to arrange a personal meeting in Baltimore, Akron, Boston, or elsewhere.

Letters held in strict confidence.

Latex and Rubber, Inc.
1075 HULL STREET, BALTIMORE 30, MARYLAND

Paper coaters: Improved coated paper specialties mean a bigger market for you—and better coated papers begin with new Opalon 410 plastisol resin. You'll find it profitable to investigate the *product* and *production* advantages Monsanto's Opalon 410 delivers in the manufacture of coated papers for luggage, shoe findings, simulated leather notebooks and other applications.

For a better product—Opalon 410 provides the strength, durability and resistance to wear your product requires. It furnishes extra resistance to greases, oils, water, detergents, and discoloration caused by sunlight. Opalon 410, when used with other quality plastisol ingredients, offers a high degree of crack-free flexibility at low temperatures. It gives good adhesion, and makes possible a wide color range of imitation leather and other embossed and decorated effects.

For fast production—Opalon 410 means easy compounding; a simple stir-in process that requires no expensive equipment. It needs no milling or grinding during compounding . . . streamlines processing operations. A fast-dispersion type of resin, it increases your speed of plastisol preparation and assures the uniformity of dispersion necessary for quality coatings.

Why not look into Opalon 410 *stir-in* vinyl plastisol resin for your paper coating needs today? For complete information, write: MONSANTO CHEMICAL COMPANY, Plastics Division, Room 6904, Springfield 2, Mass.

MONSANTO
CHEMICALS AND PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

for new equipment, spares or replacements . . .

UNITED *Service-Proved* CRACKER ROLLS

THERE IS A UNITED® *service-proved* ROLL

When you specify UNITED ROLLS, your complete satisfaction is guaranteed by over 50 years' experience in the design and manufacture of rolls for practically every type of rolling application. Precision engineered to the specific requirement of the individual machine or equipment in which they are to be used, UNITED *Service-Proved* ROLLS are in use the world over by processors of rubber, plastics, linoleum, paper, paint and scores of other metallic and non-metallic substances.

Specify UNITED ROLLS for new equipment, spares or replacements. The experience and advice of our rolls engineers is available without obligation.

FOR EVERY
- **RUBBER**
- **PLASTICS**
- **LINOLEUM**
- **TILE**
- **PAINT**
- **OR OTHER**

NON-METALLIC *PROCESSING REQUIREMENT*

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh • Vandergrift • New Castle • Youngstown • Canton

Subsidiaries: Adamson United Company, Akron, Ohio
Lobdell United Company, Wilmington, Delaware
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

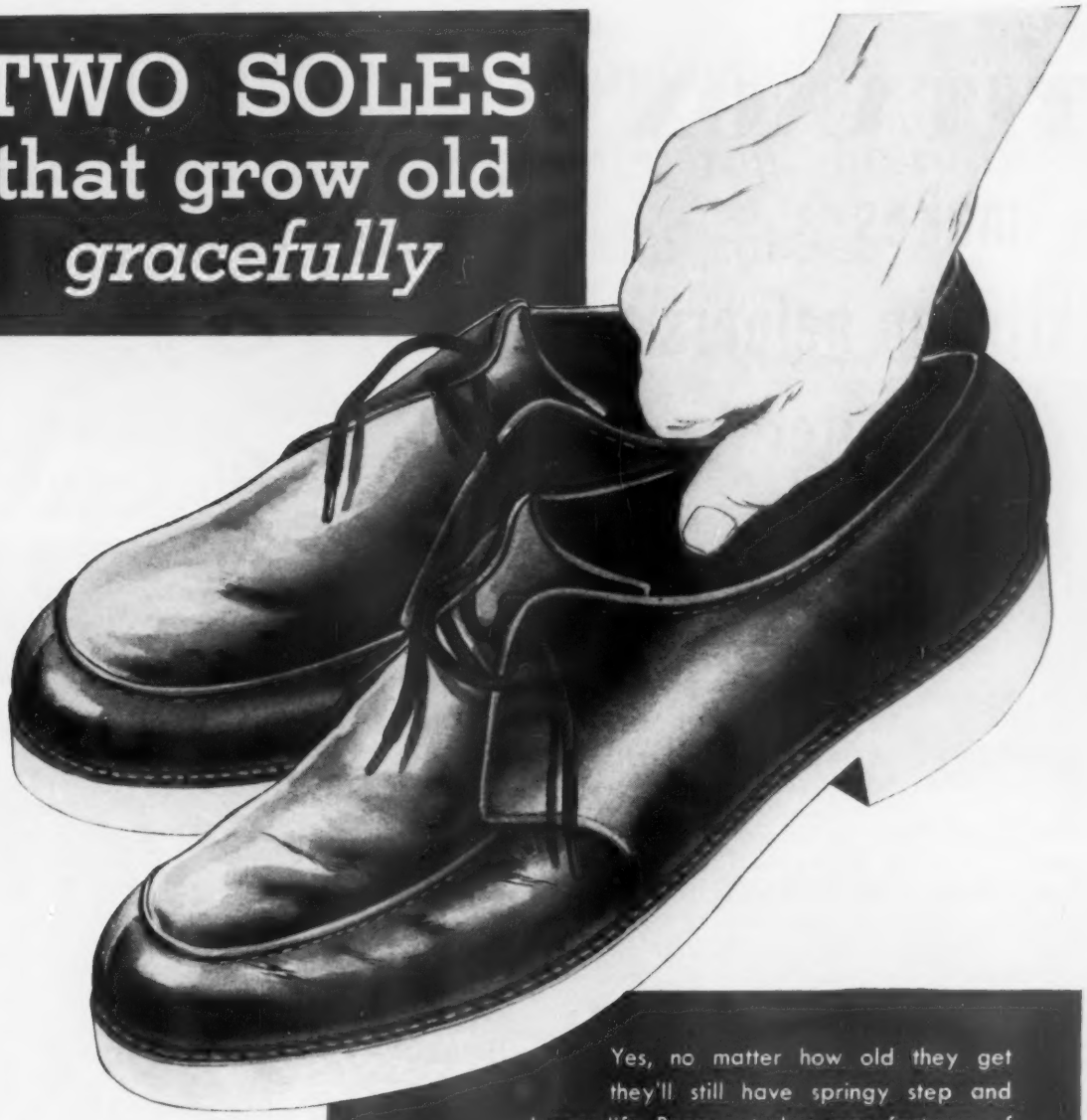
Helping YOU keep your products Uniform

Because you know that every shipment of C. P. Hall Company chemicals is exactly the same as the previous shipment, you can be sure of uniformity in the products you supply your customers. That uniformity means constant customer satisfaction. We insure constant uniform quality in every product we supply, by a rigid system of quality controls, because we realize we are protecting YOUR reputation, as well as our own.

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO
LOS ANGELES, CALIF.
CHICAGO, ILL.
NEWARK, N. J.

TWO SOLES that grow old *gracefully*



Yes, no matter how old they get they'll still have springy step and longer life. Because today, manufacturers of quality footwear use Neville Resins in compounding synthetic soles and heels, thus improving the properties of their product. They get abrasion resistance, flex-life, high tensile strength and uniform quality in the stock they use.

● *These advantages are obtainable with Neville Resins in processing other rubber products too, such as molded goods, mats, floor tile, wire insulation and mechanical goods in general!*

NEVILLE RESINS

Call us for samples and information

NEVILLE CHEMICAL CO.

PITTSBURGH 25, PA.

Plants at Neville Island, Pa. and Anaheim, Cal.

R-54

TITANOX®

makes kitchen helpers brighter

Rubber kitchen helpers such as drain mats, sink liners, stove-top mats and dishracks in white or cool pastels not only lighten kitchen chores but brighten kitchen hours.

The choice for clean whites and cheery tints in the compounds that make these helpers is TITANOX white titanium dioxide pigments. These ideal whiteners and brighteners are first choice, too, for any other compounds that must be whitened or brightened.

Our Technical Service Department will be glad to help you achieve the most desirable white pigmentation in your compounds through the best use of TITANOX. Titanium Pigment Corporation, 111 Broadway, NewYork 6, N.Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

®TITANOX
the brightest name in pigments

2421

TITANIUM PIGMENT CORPORATION
Subsidiary of NATIONAL LEAD COMPANY

"Today's tire manufacturers are using bonding agents* that literally *weld* the cords to the rubber"

says C. H. Peterson, President
U. S. Rubber Reclaiming Co., Inc., N. Y.

Mr. Peterson standing in front of the massive reclaiming equipment at the U. S. Rubber Reclaiming Co., Inc., plant in Cheektowaga, New York. At the left is a bale of reclaimed tire fabric, and at the right a pallet load of reclaimed rubber.

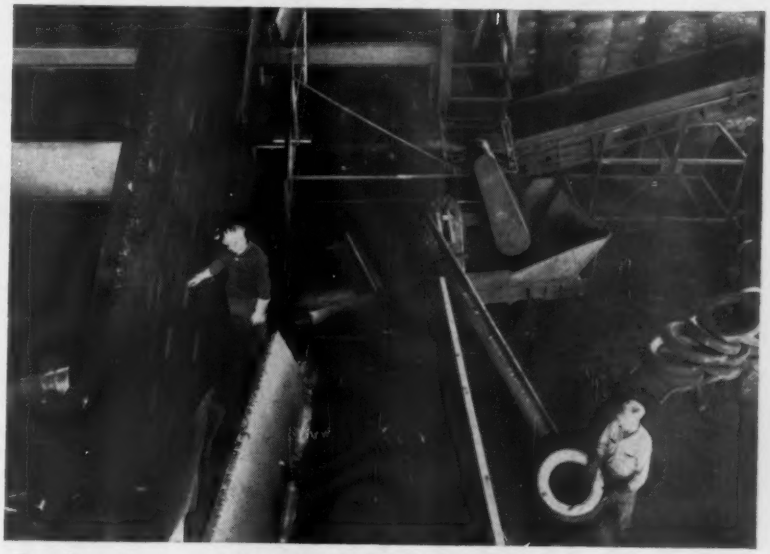
"THIS positive bonding has caused us one headache after another," adds Mr. Peterson. "The *better* the bond between the rubber and the tire fabric, the *tougher* our job becomes."

U.S. Rubber Reclaiming Co., Inc., has been forced to redesign its separation system time and again to cope with the constantly improved tires. Better grinding equipment has had to be developed to tear the stubborn fabric from the rubber. The power of the grinders, which was originally 150 h.p., has been increased steadily until it is now up to 450 h.p.

Although a "headache" to the U.S. Rubber Reclaiming Co., Inc., the toughness of today's tires is a definite advantage to the motorist.

* A good deal of the credit for permanent rubber-fiber bonds in tires can be claimed by Koppers Resorcinol. Resins made from resorcinol form an excellent bond—one that will take repeated pounding and wear, will withstand prolonged flexure under grueling service conditions without separating. Because of their superb adhesive properties, resins made from Koppers Resorcinol have also found wide application in the manufacture of industrial belting, hose, and many other heavy-duty rubber products where a powerful, lasting bond is needed between reinforcing fibers and synthetic or natural rubber.

For further information, write to:



The rolling mill, commonly known as the "cracker." These powerful rolls actually tear the tires to pieces.

KOPPERS COMPANY, INC.
CHEMICAL DIVISION, DEPT. RA-114 **PITTSBURGH 19, PENNSYLVANIA**

KOPPERS ® **Koppers Resorcinol**

SALES OFFICES: NEW YORK · BOSTON · PHILADELPHIA ATLANTA · CHICAGO · DETROIT · LOS ANGELES

expert repair

we have

NEW IDEAS

which may interest you

● Banbury repairs require big facilities. Hale & Kullgren offer these facilities through association with The Aetna-Standard Engineering Company. This company installed more than $200,000 worth of special machine tools in their Warren, Ohio, plant for the specific purpose of repairing Banburys. These photos illustrate some of the actual Banbury repair work carried on in the big plant.

Repairing Banburys requires good craftsmanship, precision and accuracy. As specialists in metalworking for more than 50 years, Aetna-Standard has a superb reputation for expert work in the machinery business.

Hale & Kullgren adds the important know-how to Aetna-Standard's craftsmanship. H & K personnel have been associated with the rubber industry for as long as 30 years.

Much of the repair work requires building parts to the original. H & K have the patterns and can supply parts. In fact, most of them are carried in stock.

Call in Hale and Kullgren for fast, dependable Banbury repair service or rebuilding.

your inquiry...

Wire, write or phone Hale & Kullgren, Inc.
613 E. Tallmadge Ave., Akron 10, Ohio
Phone: FRANKLIN 6-7161

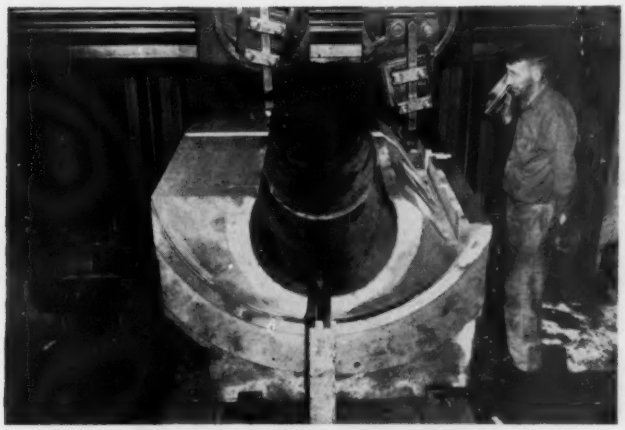
service on BANBURYS

OUR BIG SHOP HAS COMPLETE TOOLING FOR TOPNOTCH WORK

● When you need Banbury repair parts or rebuilding service, remember . . . you have a service practically at your back door.

The big Aetna-Standard plant at Warren, Ohio, sparkles with $200,000 worth of tools specifically installed for Banbury repair and rebuilding work.

When Hale & Kullgren announced their entry into the rubber and plastic machinery business three years ago, many friends said in effect — "I hope you intend to repair and rebuild Banburys. We need a service close to us."



In those three years, the Warren Plant has been busy with Banbury orders. Many midwest companies prefer the "close-to-home" service, so they can control progress of the work. They also like the personal treatment. Their maintenance men can follow the work closely in the shops and keep check on the progress of the work.

Parts do not offer a problem. Aetna-Standard has the patterns and build parts to the originals.

Another service in conjunction with repairing . . . Hale and Kullgren's engineers have been busy redesigning some of the basic Banbury parts. Several new ideas have been developed which might interest you. These changes do not interfere with the interchangeability. For example, one idea gives better control of leakage in the mixing chamber. That problem has been a bugaboo for many years in the Banbury business.

For expert service on your Banburys, remember the midwest service offered by Hale & Kullgren, specialists in designing and building rubber and plastic machinery.

We have patterns and can supply any part . . . We stock most of them

A SWAP SERVICE

In many cases, for quick service, a swap of parts can be made. You receive a rebuilt body with all parts up to standard and guaranteed. This swap of parts cuts your down time to a minimum.

SALES and ENGINEERING by

HALE AND KULLGREN INCORPORATED

MANUFACTURING by

Aetna-Standard

THE AETNA-STANDARD ENGINEERING CO
PITTSBURGH, PA

Plants in Warren, Ohio
Ellwood City, Penna.

Hose REINFORCEMENT WIRE

It is no more logical to abolish capitalism because it hasn't abolished poverty than it would be to abolish the churches because they haven't abolished sin.

Here at Johnson we're human and we sometimes sin. But we have learned to profit by mistake and go on and on improving our product and our service.

JOHNSON special bronze plated wire —standard for tire manufacturers and for vacuum and defroster hose producers. Advantages—uniformly clean finish . . . maximum adhesion to rubber . . . higher elongation . . . extra fatigue properties.

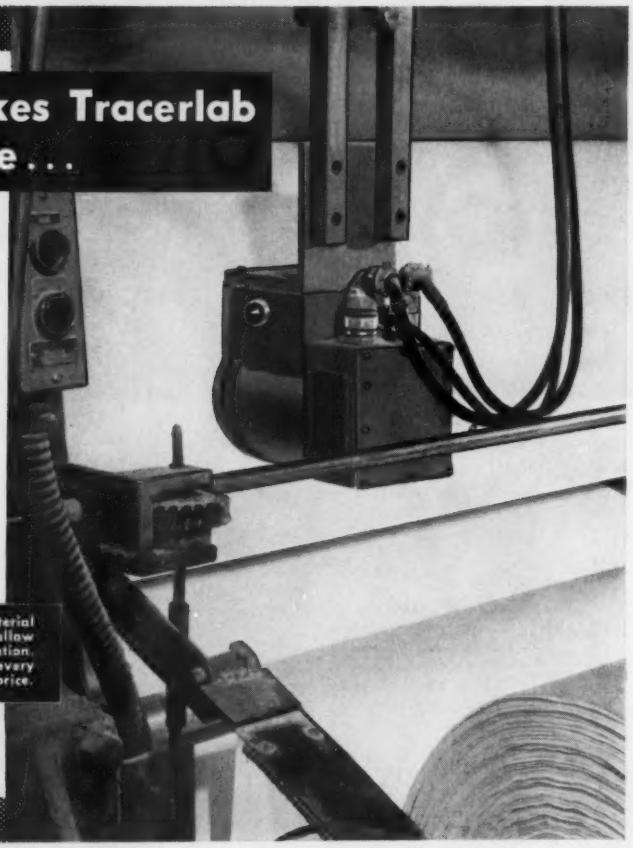
JOHNSON STEEL & WIRE CO., INC.
WORCESTER 1, MASS.
Akron, Ohio Los Angeles, Calif.
A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

SEAMLESS RUBBER Likes Tracerlab BETA GAUGES Because . . .

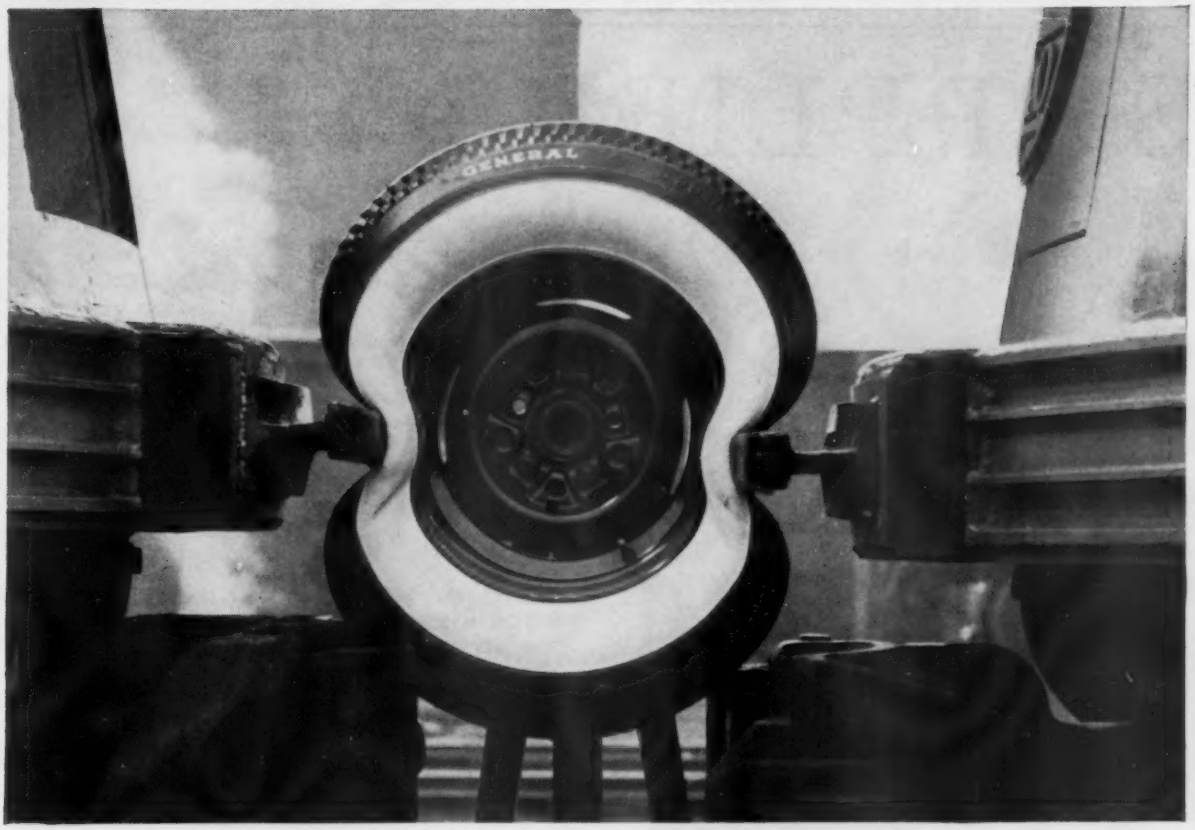
. . . SEAMLESS management says that through the use of the backscatter unit shown "we have been able to reduce variances in thickness of material application (adhesive compound) in our product by approximately 10%. We have found it possible to adjust our calender to correct gauge and maximum speed in approximately one third (1/3) the time formerly required. Any variations in thickness of material are immediately indicated. This allows us to make corrections to produce a consistent product to meet exacting specifications.

"We have also found the operators have accepted this gauge without hesitation. They have readily discarded old gauging methods and learned very quickly to accept the new gauge as a convenient and helpful asset in setting up their equipment for operation. In fact, so much so that they feel we would be unable to operate today without this equipment."

IF YOU want to cut raw material costs and improve quality . . . allow us to arrange a FREE demonstration. We have a gauge model for every application . . . at the lowest price.



Tracerlab®
130 HIGH ST., BOSTON, MASS.



CIRCOSOL-2XH GIVES YOUR TIRES EXTRA TOUGHNESS

Make the rubber tougher and more resilient, and your tires will invariably stand up better under even the worst punishment. Circosol-2XH helps you do just this . . . and without getting your material costs out of line.

Tires made with Circosol-2XH have greater resistance to abrasion, and can take sharper impacts and more all around abuse than tires made with ordinary softeners. Circosol-2XH helps inhibit the spread of cuts, and helps tires endure hard summer driving on hot roads without developing damaging heat build-up.

The cost of this added protection is surprisingly low. For example, enough Circosol-2XH for an 8.00 x 15 size 100 level tire costs less than 2¢ more than the cheapest softener you can buy. Cheap insurance, to say the least.

You can get the full story on the advantages of Circosol-2XH from your local Sun Oil Company Representative. Or write Dept. RA-11.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY

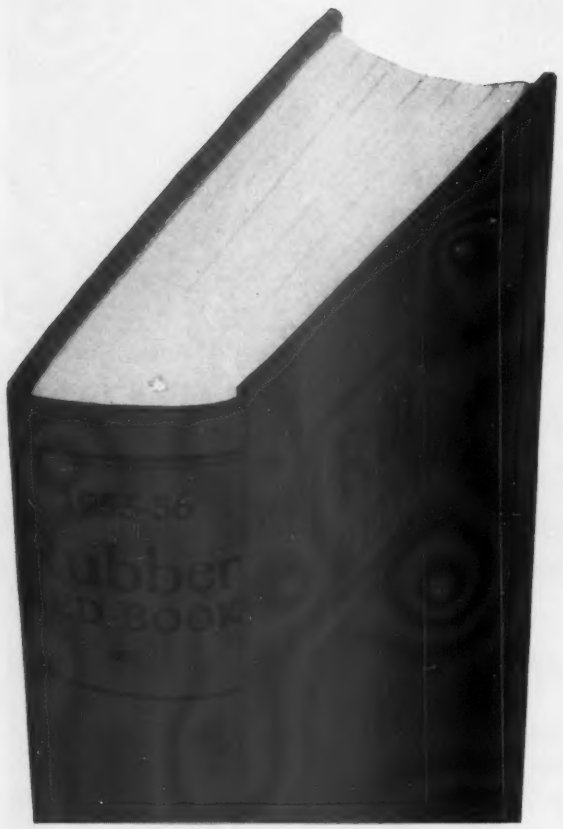
SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

Refiners of famous High-Test Blue Sunoco Gasoline

SUPPLIERS-

Plan now on full story of 1955-56



Though the 1955-56 issue of the RUBBER RED BOOK will not close until next April, it is not too early to give consideration to the use of space in that issue and to include the necessary amount in your 1955 budget.

The Editors are planning an even larger and more comprehensive 1955-56 RUBBER RED BOOK. Each issue has been more complete than the previous one — has had more pages, more rubber companies and suppliers, more new listings, new sections, improved and expanded sections, new information added. Yes, every new edition is more complete and more useful . . . and users mince no words in telling us so!

The constant improvement in the RUBBER RED BOOK is the key to its solid acceptance by the rubber industry. Add to that the fact that **each advertisement remains effective for two full years** and you have the unbeatable combination of effectiveness and economy! Small wonder that some suppliers use up to 20 pages of advertising to get across every detail of their story.

Make sure that your company is represented with adequate advertising space in the 1955-56 issue. During the two-year life of this edition buying decisions involving more than $4 Billion will be made. Your advertisement in the RUBBER RED BOOK will be just like having your own salesman present when these decisions are being made . . . **but your products may not even be considered if information on them is not available at this critical time.**

Plan now for sufficient space in the next edition to tell the full story of your products . . . your services . . . your equipment. Send in the Space Reservation Coupon (on opposite page) today!

Condensed Schedule of Rates for 1955-56 Edition

1 Page	$175.	2 Pages, each	$170.
½ Page	95.	2 Half Pgs., each	92.
¼ Page	55.	2¼ Pages, each	53.
Colors, Red	extra $65.		
Other Colors	extra 85.		
Bleed Pages	extra 20%		

For complete rates and sizes write for 1955-56 rate card

Published by

RUBBER AGE

250 West 57th Street, New York 19, N. Y.

enough space to tell the your products in the RUBBER RED BOOK

Users Like the RUBBER RED BOOK!

Hundreds of letters are on file attesting to the worth of the RUBBER RED BOOK. Users stress its **practical value** . . the evident **thoroughness** with which each section has been developed . . the intimate **knowledge** of the rubber industry that is so apparent . . the infinite **detail** and wide **variety** of its contents.

All of these combine to make it more than just a directory. It is, in the words of one user, ". . a working encyclopedia of the rubber industry that is indispensable to every department of our plant."

Tenth Issue — 1955-56 Edition

Closing Date for Copy — April 1, 1955

Publication Date — June, 1955

The comments cited are typical of how people feel about the RUBBER RED BOOK, and help to explain why it has become such an important buying influence in the rubber industry. It is reliable and relied upon. That's one of the many reasons why you can present the story of your products in the RUBBER RED BOOK with complete assurance that your advertisement will be seen and acted upon!

Use the SPACE RESERVATION below, or send us your own Purchase Order.

RUBBER AGE,
250 West 57th St., New York 19, N. Y.

..... 19.....

You are hereby authorized to insert in the 1955-56 Edition of the RUBBER RED BOOK the advertising of the undersigned to occupy the space of ..... for which we agree to pay $..... as per your 1955-56 rates. (Copy will be sent you before April 1, 1955).

FIRM NAME _____

ADDRESS _____

SIGNED BY _____ TITLE _____

ONE MAN CAN OPERATE
FROM 1 TO 17 . . .

Holmes

SPONGE RUBBER
VULCANIZING PRESSES
. . . Simultaneously
DEPENDING ON CURING TIME

Original Cost . . . 80% Less

With The HOLMES SPONGE RUBBER VULCANIZING PRESS--there's no effort, no exertion, no operator fatigue. Mold remains set --no need to separately lift it each time. Locking and release is accomplished by simple foot action. Thus one man can operate from 1 to 17 at a time. Costs 1/5 of any other press that will do the same work.

WRITE OR WIRE FOR SPECIFIC DETAILS--regardless of your particular requirements. With 52 years know-how specializing in machinery and molds for the rubber industry--Holmes can help you solve your problems, too, just as they have for so many others. No obligation, of course.

SEND FOR ILLUSTRATED FOLDER...TODAY

Stanley H. HOLMES Company

3300 WEST LAKE STREET • CHICAGO 24, ILLINOIS

A NEW Weather-Ometer®

. . . for Weather Testing of Plastic and Rubber Products

MODEL DMC

Greater accuracy and reproducibility achieved with new modulated temperature control.

Accuracy in test results is greatly increased in the new DMC Weather-Ometer by a positive control of specimen temperatures.

A constant volume of air at a controlled temperature in the heavily insulated cabinet, maintains uniform predetermined specimen temperatures regardless of variations in room conditions.

Automatic control of humidities up to dew point is available as optional equipment.

All automatic controls including complete voltage controls are located on the front panel of the Weather-Ometer directly above the door of the test chamber.

Both horizontal and vertical testing is available. Shallow containers are used for semi-liquid materials and vertical panels for solid materials.

Source of radiation is two Atlas enclosed violet carbon arcs.

Complete technical information on the DMC model and other Weather-Ometers is contained in the new Weather-Ometer catalog. A copy will be mailed on request.

ATLAS ELECTRIC DEVICES CO. • 361 W. Superior St. • Chicago 10, Ill.

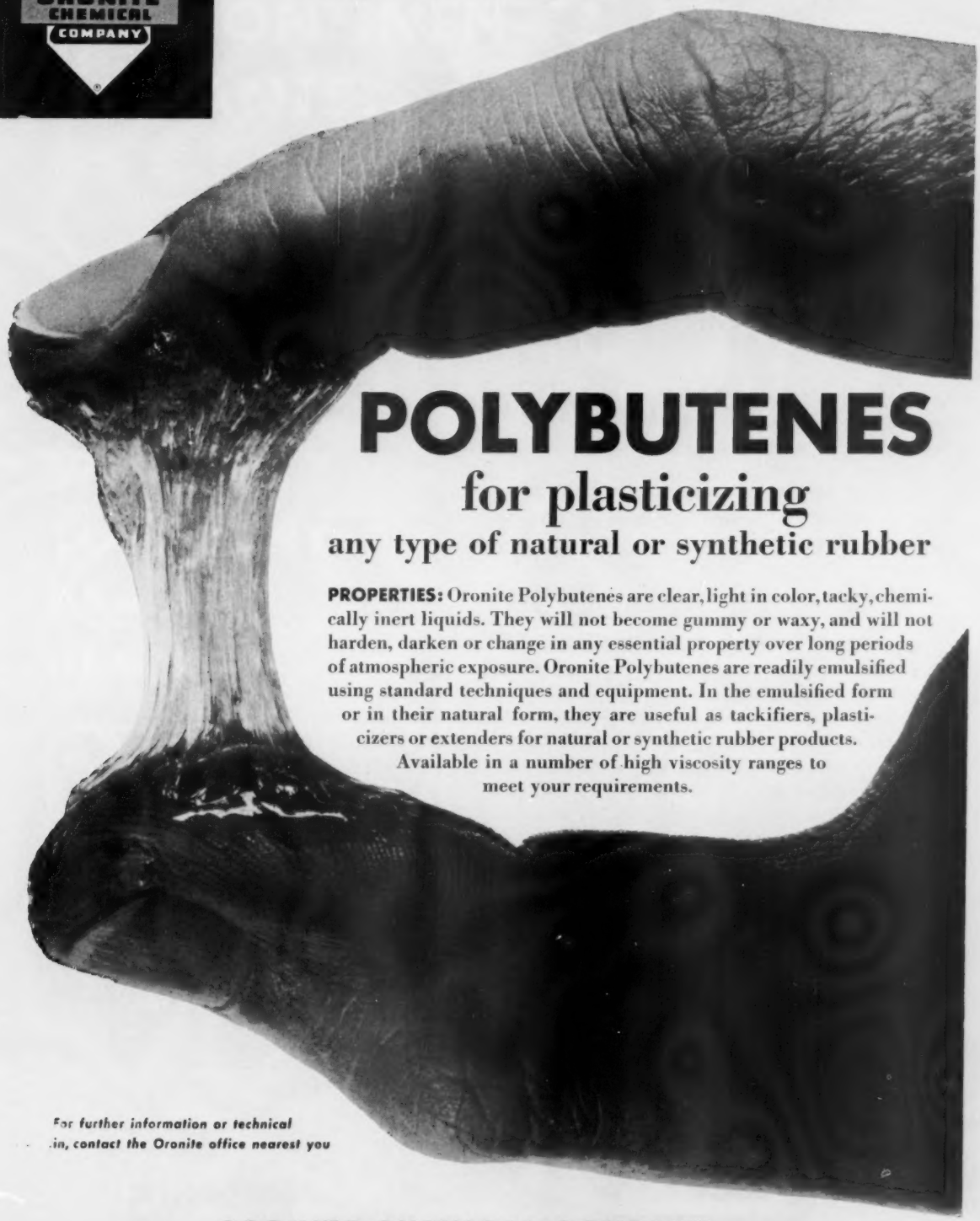
Manufacturers of accelerated testing equipment for over a quarter of a century.

WEATHER-OMETERS • FADE-OMETERS • LAUNDER-OMETERS

ORONITE CHEMICAL COMPANY

Original and Major source of supply!

(Oronite Polybutene was first produced and sold in 1935)



POLYBUTENES

for plasticizing

any type of natural or synthetic rubber

PROPERTIES: Oronite Polybutenes are clear, light in color, tacky, chemically inert liquids. They will not become gummy or waxy, and will not harden, darken or change in any essential property over long periods of atmospheric exposure. Oronite Polybutenes are readily emulsified using standard techniques and equipment. In the emulsified form or in their natural form, they are useful as tackifiers, plasticizers or extenders for natural or synthetic rubber products. Available in a number of high viscosity ranges to meet your requirements.

For further information or technical ...in, contact the Oronite office nearest you

ORONITE CHEMICAL COMPANY

200 Bush Street, San Francisco 20, California • 714 West Olympic Boulevard, Los Angeles 15, California
30 Rockefeller Plaza, New York 20, New York • 20 North Wacker Drive, Chicago 6, Illinois
Mercantile Securities Building, Dallas 1, Texas

Thiokol®

PLASTICIZER TP-90 B

Yields Maximum Low Temperature Flexibility and Maintains Excellent Physical Properties

"Thiokol" Plasticizer TP-90 B is an efficient low temperature plasticizer. Even at high concentrations it does not appreciably impair the physical properties of the compounds in which it is used.

"Thiokol" Plasticizer TP-90 B is highly compatible with natural rubber, Neoprene, nitrile-type rubbers and GR-S. It imparts excellent low temperature flexibility to these elastomers and maintains high resilience over a wide temperature range.

The following results illustrate how "Thiokol" TP-90 B yields excellent low temperature flexibilities while still maintaining the physical properties:

	Natural Rubber	Neoprene GN	Hycar OR-15	Paracril-B	GR-S
TP-90B, p. h. r.	30	20	30	30	30
Cure, min. /° F.	30/310	45/300	30/310	30/310	30/310
Tensile, p. s. i.	2200	2600	2380	2250	1500
Elongation, %	530	410	300	350	380
Shore Durometer	42	68	70	61	45
Low Temperature Flexibility**	**–95°F**	**–70°F**	**–70°F**	**–80°F**	**–95°F**

****Determined according to a modification of ASTM method D 1043-49T. The temperatures shown are the values at which the absolute torsional moduli are 10,000 p. s. i. Although the specimens were still quite flexible, G10,000 was arbitrarily chosen as the stiffening point.**

For technical information and samples, write:

This information is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data, or the use of this product.

Thiokol Chemical Corporation

SYNTHETIC RUBBERS • PLASTICIZERS • CHEMICALS • SOLID PROPELLANTS

784 NORTH CLINTON AVENUE • TRENTON 7, NEW JERSEY

In Canada: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario

5 MODERN WITCO-CONTINENTAL PLANTS...

Ponca City, Oklahoma—our newest plant

Five good reasons why you can depend on

WITCO-CONTINENTAL CARBON BLACKS

always uniform . . . always dependable

Sunray, Texas

Producing a complete line of carbon blacks under strictest quality controls to fulfill your most rigorous requirements.

Check your needs against Witco-Continental's Channel and Furnace Blacks listed on the next page . . .

Westlake, Louisiana

Eunice, New Mexico

Witco, Texas

Witco-Continental CARBON BLACKS

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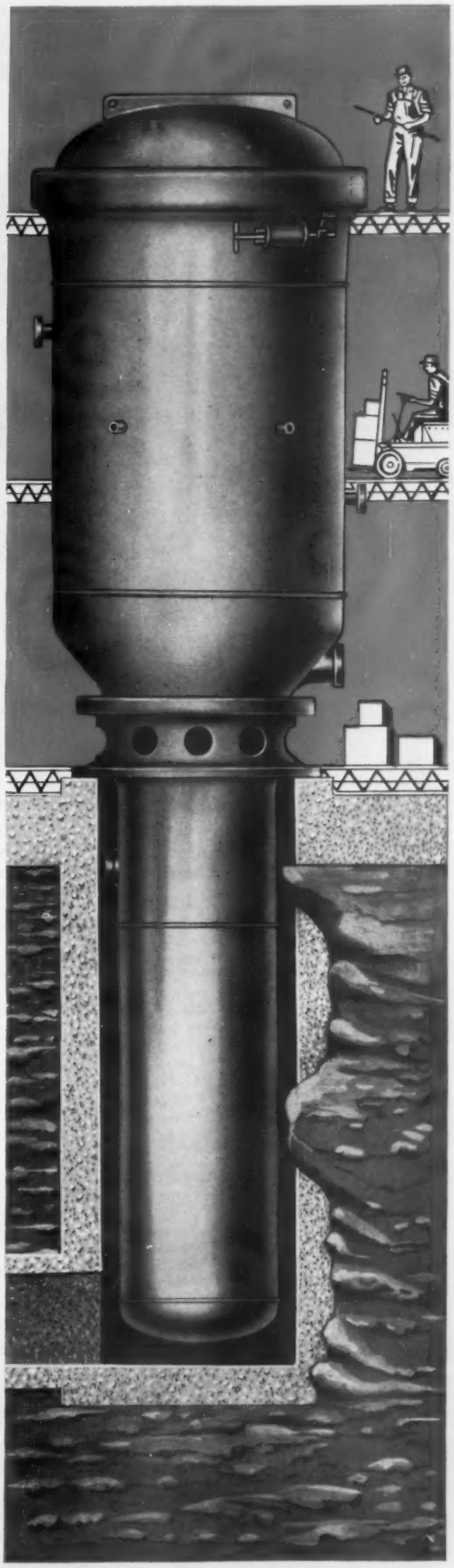

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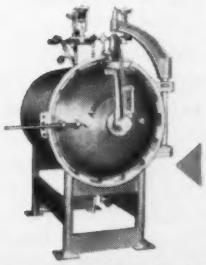

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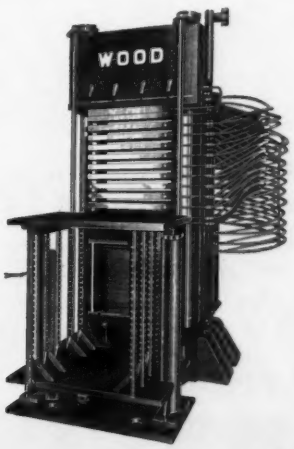

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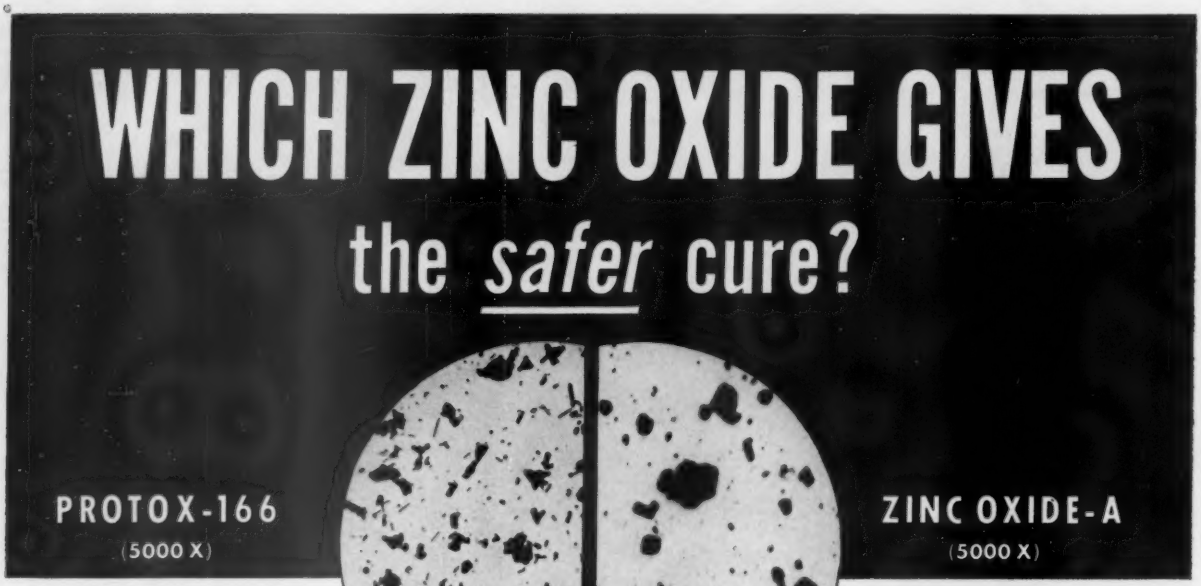

Protox-166 imparts safer cure because of its uniformity in each shipment, and wide range of particle size.

Not a Horse Head oxide. As a result of its low surface area, narrow particle size range, and particularly its absence of fines, it does not offer the high safety and uniformity of cure provided by Protox-166.

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- Give uniform cure, because of complete dispersion

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- Speed mixing and dispersion of finer particles
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No zinc oxide outside the Horse Head family has such a wide range of particle sizes.

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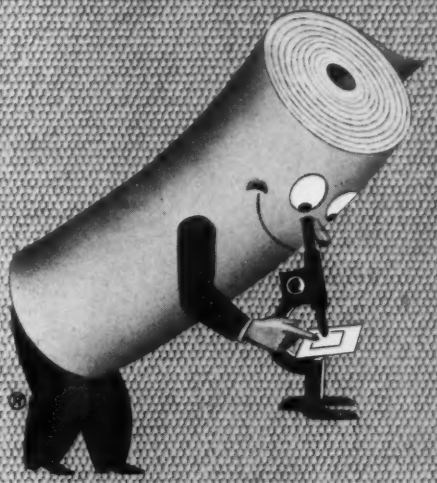

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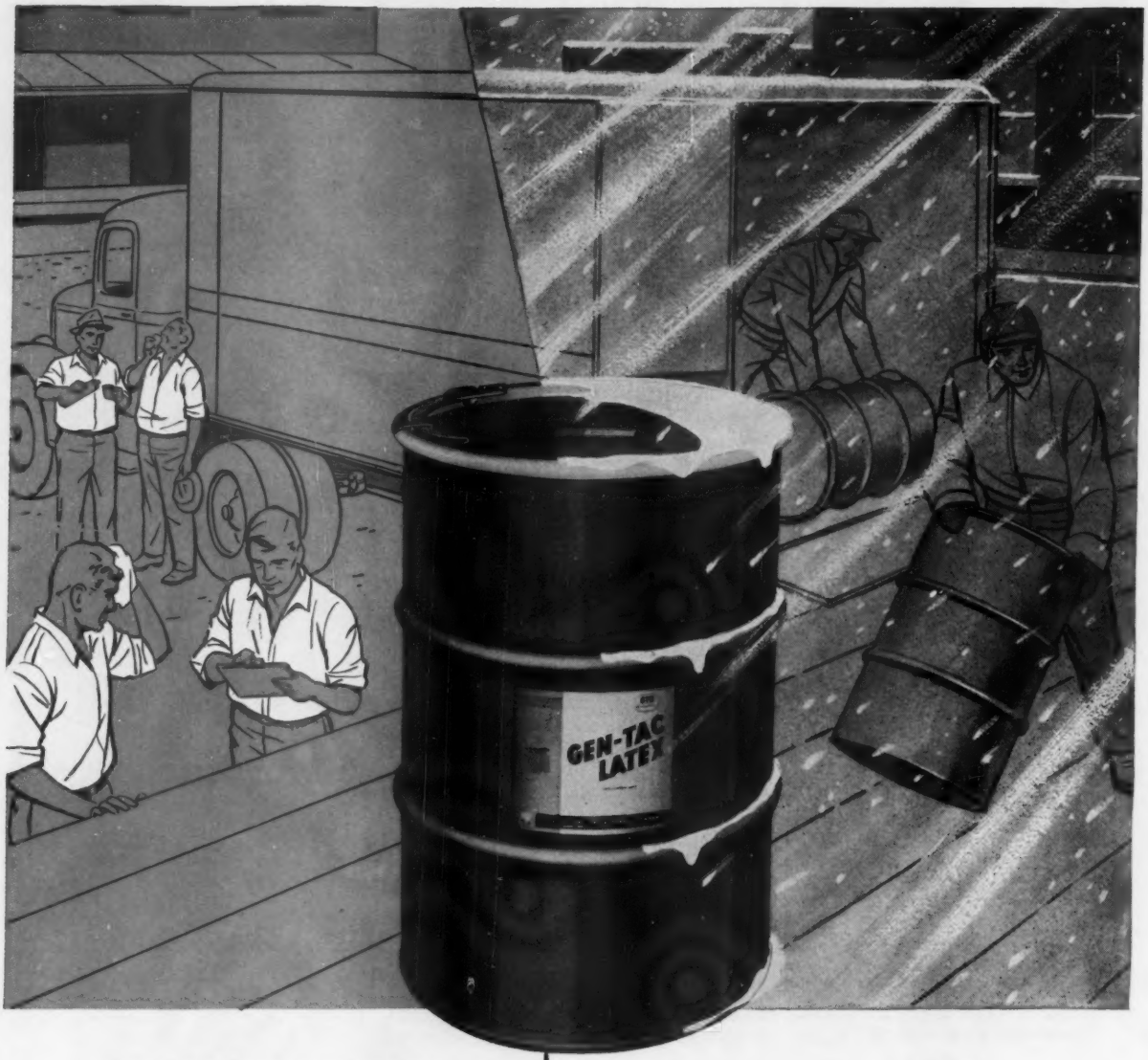

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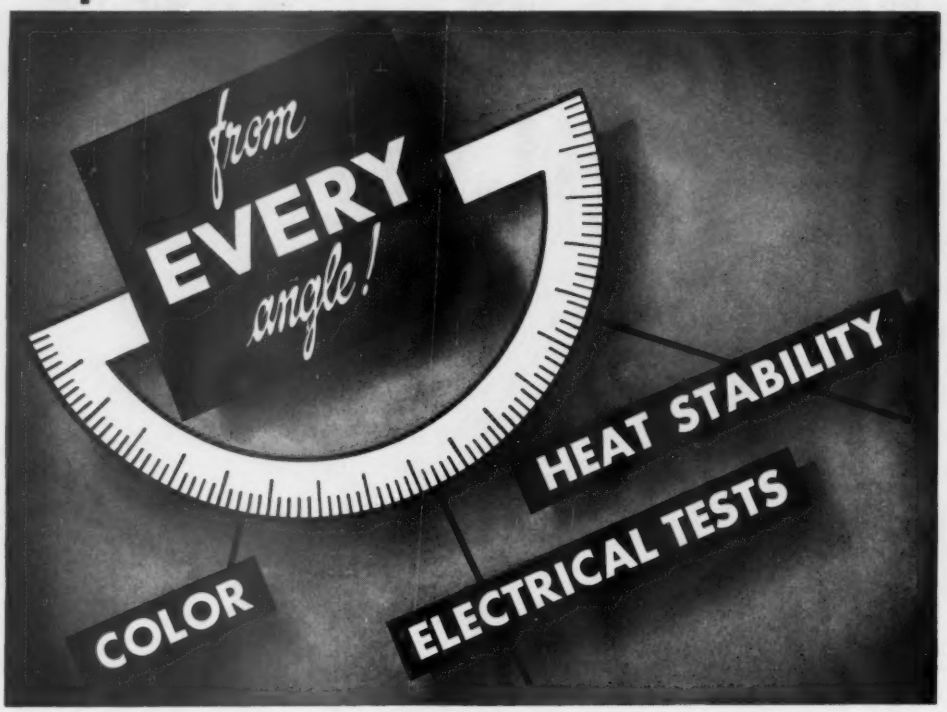

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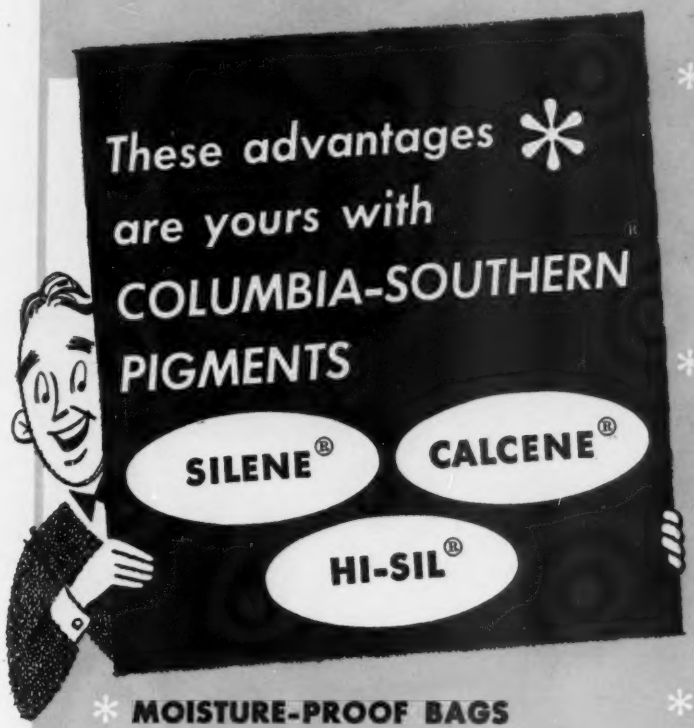

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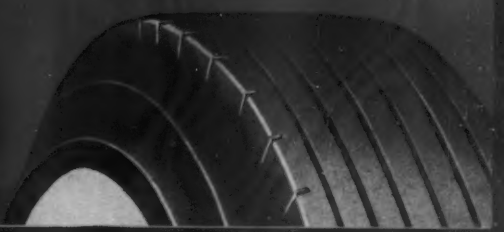

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SUPREX Clay	40
Zinc Oxide	3
Plasticizer	7.5
MBTS	1.5
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Sulfur	2.5

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Styrene Resin	25
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Zinc Oxide	5
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Aktone	**5**
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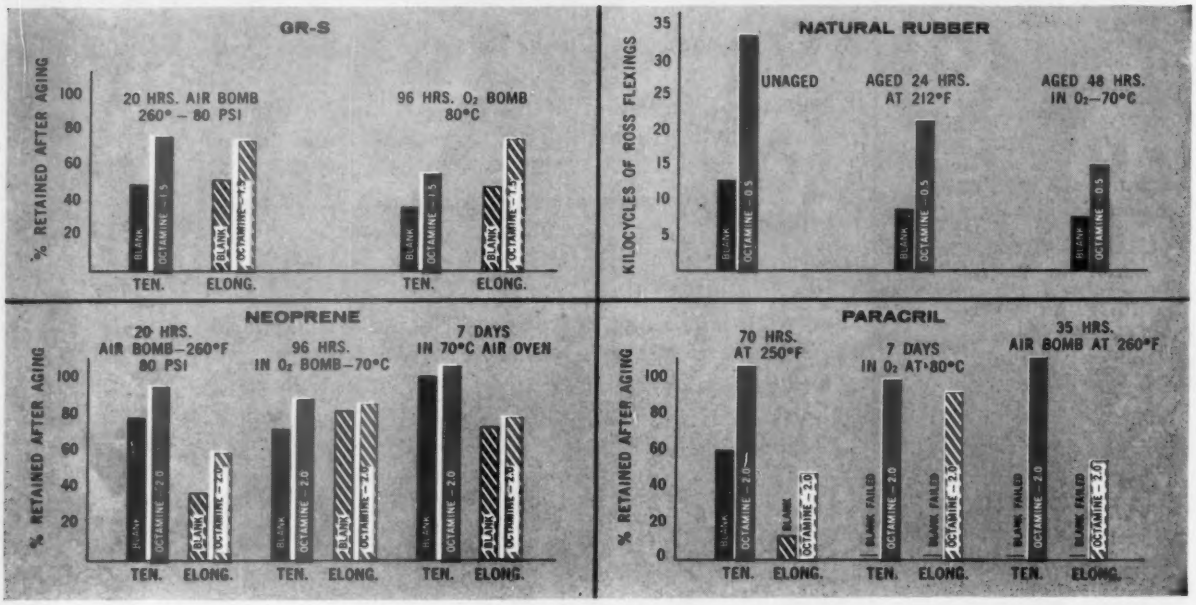
minus discoloration



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RUBBER AGE

Vol. 76, No. 2 NOVEMBER, 1954

How Firestone Uses Silicone Release Agents

By D. R. ENDRES

Compounding Division, Firestone Tire & Rubber Co., Akron, Ohio

SILICONE release agents have proven themselves to be valuable aids to production at Firestone. The fact that they do not carbonize on the mold surfaces has effected a substantial reduction in mold cleaning and maintenance costs, and their remarkably high order of non-adhesiveness or "slip" has helped minimize or eliminate a wide range of difficult release problems throughout all our plants.

As far as mixtures and methods go, there are almost as many release dopes and application techniques as there are factories in the industry. Circumstances and conditions vary widely, of course, but in the end the determining factor is effectiveness. The following are the materials and methods which have proved most effective in our plants.

One controversial application, for instance, is that of green tire tread dope. In 1950 we began using a silicone tread dope to forestall the tendency of certain tread compounds toward torn designs upon removal from the mold. Today its use has become standard on all passenger and truck tire production where tearing of designs becomes a problem.

The dope, a solution of 0.5% straight silicone fluid in 80% alcohol and 20% gasoline, is applied by means of an automatic spray device. Finished green tires are carried down a slightly declined belt into a small spray booth. Two motor-driven rolls rotate the tire rapidly, while three parallel overhead spray guns, automatically energized by the weight of the tire, apply a fine spray from a distance of less than a foot. The spray cuts off after one and one-half revolutions of the tire, enough to assure thorough coverage. The following tire dislodges the sprayed tire away from the twin rollers and on to another conveyor belt. Production averages a tire every six seconds.

Only the center, or tread, spray gun is loaded with silicone dope. Our experience indicates that excessive silicone on sidewalls may cause flow cracks and non-knits during molding, so the two side sprays are loaded with a conventional inorganic solution. The dope is pressure-fed from 30-gallon tanks (Fig. 1), where it is kept under constant mechanical agitation. An extra drum is kept on hand at all times to assure uninterrupted production. Production averages about 260 tires per gallon.

Tires above or below the standard sizes require a different technique and a different dope. To ease their handling, these tires are all lightly dusted with starch after being made up. The silicone tread dope is wiped or swabbed on by hand any time prior to actual molding. Because aqueous solutions evaporate too slowly, the most common dope is a solution of 0.5% straight silicone fluid in 50% isopropyl alcohol and 50% gasoline. The same concentration of silicone fluid in 100% gasoline is also effective, but it is considered a fire hazard and is not commonly used.

We do not believe that the band ply, or the inside of the tire, ordinarily requires the use of silicone release agents. Only on specialized applications, such as interior-

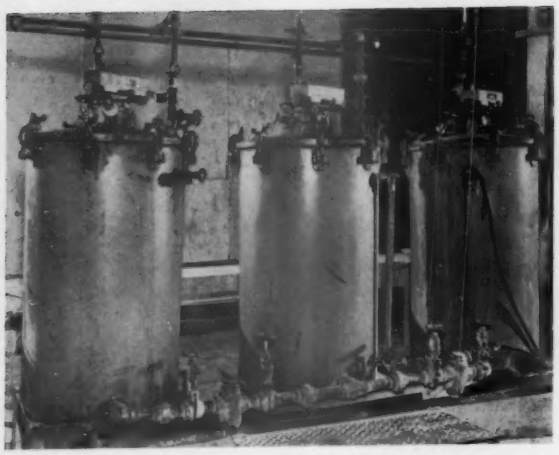

FIG. 1—Silicone tread dope for green tires is pressure-fed from 30-gallon tanks of this type. The dope is kept under constant mechanical agitation.

ribbed tires, has its extra order of "slip" been found worthwhile. When it is used, however, the concentrations are fairly high. Most effective to date has been a solution of 7½ parts of Dow Corning XE-106 (a high-viscosity silicone emulsion), 7½ parts of glycerine, and 85 parts of water.

Similar formulae have been investigated on curing bags and although the curing bag dope question is not completely settled in our plants as yet, various concentrations ranging from 8% each of XE-106 and glycerine down to 4% each in water have been given extended production trials. However, it is believed that the active ingredient concentrations may be reduced still further without impairing effectiveness.

On the other hand, silicone agents have long been accepted on the Butyl bladders of our Bag-O-Matic presses. New bladders are wiped down with the straight 35% silicone emulsion when installed (Fig. 2), and the same emulsion is swabbed on them every twelfth cure during production.

By far the most common use for the regular silicone emulsion, of course, is on the surfaces of the molds themselves. First employed by Firestone in July of 1946, it is now applied every heat to every passenger and truck mold in the plant. The formula used consists of 1% silicone emulsion and 0.3% detergent in water. The detergent is used for its foaming action, which helps wet the mold and give more even distribution.

Our passenger and truck pot heater molds operate on a production-line basis. One man sprays the top halves of the molds heavily as they are conveyed past him (Fig. 3), at the same time swabbing the bottom half. Passenger and truck unit press molds are usually brushed down with a saddle brush.

The larger and smaller than standard presses and pot heaters utilize a slightly different mix: 0.6% emulsion and 0.2% detergent in water. Most of these units are also coated with a saddle brush (Fig. 4) with greatest attention being paid to the front of the top and the back of the bottom half, so that the opening mold will cock the tire for easy removal.

Presses for giant tires are usually sprayed with the same mix. The spray arrangement is made up of a standard air hose with a short length of extra hose attached perpendicularly to the nozzle (Fig. 5). Each pressman carries his own supply of mold dope in a small container. He blasts the mold out with air first, blowing away any residue. Still blasting, he dips the short feeder hose into his can of dope. Rushing air in the main hose converts the short hose into a syphon, which lasts while the pressman sprays the mold and ends abruptly when the feeder hose is withdrawn. The pressman then blows out the mold to help evaporate the water prior to inserting the tire.

Effect of Cleaning Intervals

A common drawback to efficient, dependable production has always been the uncertainty as to how long any given mold will operate between cleanings. Cleaning intervals are usually dictated by the appearance of the finished tire or, more directly, the amount of build-up on the mold surfaces. Build-up, a product of tire dope, airbag dope, air-borne dust, and decomposed mold dope, forms erratically. The same mold may need cleaning at irregular intervals.

FIG. 2—Butyl bladders in the Bag-O-Matic presses are wiped down with a straight 35% silicone emulsion when installed, and subsequently swabbed every twelfth cure.

FIG. 3—Every Firestone passenger and truck tire mold is treated with silicone after each heat. Here an operator is spraying the top half of a pot heater mold.

FIG. 4—Most of the larger and smaller than standard presses and pot heaters are also coated with a saddle brush, as can be seen in this view.

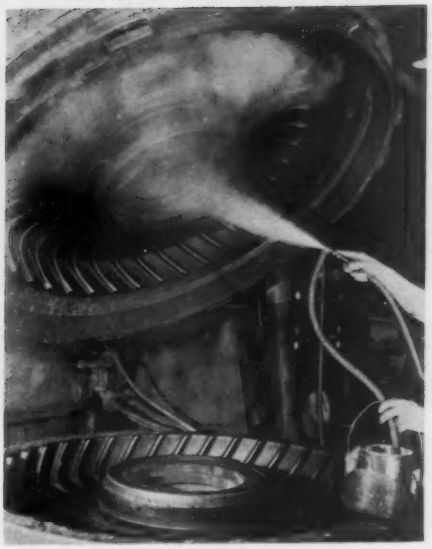

FIG. 5—Special spray arrangements are used for applying silicone mixes on tractor tire and other giant tire molds. The short hose is temporarily converted to a ***syphon.***

Although it is difficult to assess their performance exactly, silicone mold dopes definitely reduce cleaning schedules. Non-carbon-forming and highly heat-stable, they do not cause build-up in the order of formerly used materials. To take full advantage of that fact, regular cleaning schedules for all of the molds in our plant, from pot heaters to Bag-O-Matics, have been established. Frequency of cleaning is variable depending on production, etc., but a general average is weekly.

Our procedure for getting mold dope to the scene of production is relatively simple. Percentage formulae, translated into pounds by company chemists, are compounded in the "cement house," so known because rubber cement is made there. Most pressmen get their own day's supply at the beginning of their shift or have it brought to them by a floor service man. The only exceptions are the spray tanks for the pot heater lines and the tread booths, all of which are replenished as needed from stand-by drums. Some dopes are transported through piping.

Additional Silicone Applications

Silicone release agents have other uses at Firestone other than direct tire production. Our Bag-O-Matic bladders, for instance, utilize silicone in their own molding. In this process, thick, narrow hoops of Butyl are flattened out and vulcanized in a close-fitting steel shell and core transfer mold. Both the shell and core are swabbed with a 1% solution of 35% silicone emulsion before each heat. This procedure has been standard with us since the inception of the Bag-O-Matic bladder presses themselves.

To help the bead of giant tires (16.00's and up) slip over the forming ring in the mold, operators used to wipe the bead with a swab saturated with 35% silicone emulsion. This application was also used on 55-inch Bag-O-Matics to some extent. However, because some operators tended to apply more fluid than was strictly necessary, the 100% silicone fluid has been reduced to 5% in solvent. This concentration may be reduced further in the future if current tests indicate its efficiency.

Swabs saturated with straight silicone fluid are still used as needed, however, on our chrome-plated tube resplicing mandrels. Here, shortened tire inner tubes are joined again under heat and pressure. Silicone fluid keeps the mandrels clean and free from build-up, and as it does not contact the splice it has no material effect on the strength of the splice.

Silicone fluid is also used on fitted molds to ease metal to metal slippage. A brushed-on dope of 0.5% fluid in 80% alcohol and 20% gasoline provides good slip without gumming or producing build-up even between metals.

Silicone fluid is also useful as a high temperature lubricant on the automatic connectors in our jacket-type passenger tire presses (Fig. 6). Designed to automatically connect the bag to steam when the mold closes, the connectors utilize a plastic packing around their main inner valve. Experience has shown that a single drop of silicone fluid, applied every two or three days, substantially lengthens the service life of this packing.

The service life of new outer seal gaskets on standard

FIG. 6—Silicone fluid also finds application as a high temperature lubricant. Here it is being used on the automatic connectors in a jacket-type passenger tire press.

FIG. 7—A special silicone fluid, which is soluble in alcohol, is used to prevent build-up on the hot steel cores of truck tire flap molds. In this illustration, an operator is swabbing on the fluid.

McNeil dome presses is also greatly lengthened when treated with silicone. A 1% solution of 35% emulsion in water, with a trace of graphite added, has proven noticeably effective.

Silicone emulsion is also an excellent emergency lubricant around the plant. A good example of this is seen in a problem associated with several Banbury mill stock chutes which were so designed that their loads frequently stuck or jammed in transit. Stock lube based on clay was sprayed through an opening in the sides of the chutes, but only when silicone emulsion was added, in the order of one pint to 5 gallons of stock lube, did the spray prove effective. Design modifications in the chutes themselves, of course, will soon eliminate this problem entirely.

FIG. 8—Industrial tires are also produced in Bag-O-Matic presses, but since temperatures run much cooler the bladders are doped only once during their use. The white residue on the top half of the mold in this illustration is the result of adding detergent to the dope.

FIG. 9—Silicone emulsions are also widely used in the production of mechanical goods, as indicated in this view taken in one of Firestone's midwest plants.

A new and somewhat different silicone fluid is showing promise in an application where all other lubricants tested gave unsatisfactory performance. Conventional organic dopes rapidly formed a bad build-up on the hot steel cores of our truck tire flap molds. Aqueous solutions of silicone agents did not evaporate quickly enough to permit continuous operation of the molds, and solutions containing naphtha or gasoline were considered too much of a fire hazard. The problem has apparently been completely solved with a silicone fluid which is soluble in alcohol. Applied in a 10% concentration every heat (Fig. 7), it gives excellent release with minimum build-up. Although employed to date only in this one application, the material appears effective and versatile enough to warrant consideration for extended use in other applications throughout the plant.

One of our Eastern plants has a Bag-O-Matic press molding small industrial tires for wheelbarrows, tractors and other implements. Its production rate is approximately 13 cures per shift. Molding temperatures here are cooler than with the passenger tires, and normally the bladders in this stand are doped only once during the course of their life (Fig. 8). Of course, if for some reason the stripping action becomes severe or if the tire shows a definite tendency to stick to the bladder, they are redoped.

This eastern plant also employs a tread dope of 2% silicone fluid in odorless gasoline for certain tires which have an unusually deep and complex tread and also for normal tires which are cured in vulcanizing units where the extraction methods are conducive to mold tearing. This mixture is swabbed on tread before curing.

At a Firestone plant in the midwest a mold lubricant of 0.5% silicone emulsion in water is used for molded goods such as shock mounts, fan belts, and other mechanical goods (Fig. 9). This plant is also using silicone rubber gaskets and seals on the steam and oil lines for their batteries of presses. Organic rubber gaskets required replacement after 2 or 3 days; silicone rubber gaskets last 2 or 3 weeks.

What with constantly rising labor and materials costs, release dope selection has become a relatively important factor in economical and efficient tire production. Since we began using them almost ten years ago, the silicones have proven to be valuable production aids. Their costs have dropped as steadily as their variety and versatility has increased, and we anticipate their even more widespread use in the future.

Electronic Elimination of Stray Metal in the Production of Synthetic Rubber

By F. J. SACKFIELD
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SYNTHETIC rubber has always had a significant advantage over natural rubber relative to freedom from dirt and extraneous impurities. For a number of years, however, the acceptability of the synthetic product was impaired because of its occasional contamination with tramp metal.

Processing equipment in the plants of rubber product fabricators represents a heavy capital investment. This equipment is not only large in size but is also of a precision nature with moving parts that are highly polished and ground to exacting tolerances. The passage of metallic objects through such equipment is known to have caused extensive damage. In order to maintain uninterrupted production schedules and prevent costly equipment repairs, it is of paramount importance that the consuming plants obtain rubber which is free of metallic inclusions.

Recently, the Kentucky Synthetic Rubber Corp., an agency for the Federal Facilities Corp., located at Louisville, Kentucky, and a major supplier of GR-S synthetic rubber, installed equipment for the continuous inspection of its finished product to assure that no tramp metal is embedded in the rubber bales. Allis-Chalmers electronic metal detectors were selected for this application after a thorough study of all available methods because of the quality control they exercise and because they were easily adaptable to plant production flow.

General Manufacturing and Contamination Problems

The major processing steps in the manufacture of GR-S synthetic rubber are:

A. Polymerization of butadiene and styrene to produce latex.
B. Stripping of excess butadiene and styrene from latex.
C. Coagulation of latex to crumb-like particles.
D. Washing of rubber crumb.
E. Drying of rubber crumb.
F. Compacting of crumb into rubber bale.
G. Packaging.

It is during steps C, D, and E, and principally during step E, that the danger of contamination of the product with tramp metal exists.

The rubber is dried in large hot air ovens each of which has a capacity of 4,000 to 5,000 pounds of product per hour. The crumb is supported on endless perforated belts of which there are three in each drier, stacked one above the other. Drying is accomplished by blowing hot air through the crumb as it is slowly conveyed on the belts from the feed to the discharge end of the drier. The total travel time is approximately one hundred minutes.

The sources of tramp metal in such a drier probably are the following:

(1) Small nuts and bolts which dislodge during normal operation.
(2) Larger metallic objects which detach through wear or vibration.
(3) Mechanical failure of the equipment in which breakage occurs, allowing metallic objects to enter the system.
(4) Routine maintenance on the equipment during which tools and other objects might be left in the drier.

From the moment that the rubber enters the drier until it is ejected from the baler in a finished block ready for packaging, it is traveling through a closed system where close inspection is impossible. Despite the utmost human diligence it would be the exception rather than the rule that foreign matter would be visually detected once it had entered the rubber stream.

The Consumers' Viewpoint

This matter of metallic contamination was of great concern to the consuming plants. Equipment shutdowns resulting from damage caused by metallic inclusions not only created costly repairs, but tight production schedules were sometimes jeopardized. There was also the further chance and embarrassment of passing on inferior articles to distributors and the public. In the days before electronic metal detectors screened each bale of rubber before it was packaged, it was not unusual for the GR-S producers to receive bitter complaints due to metallic contamination. The following may be considered typical:

> "We are forwarding to you under separate cover the piece of metal referred to and you can readily see that if it had completely passed through the rolls considerable damage would have occurred.
> "We were able to stop the unit before it had completely passed through. However, both rolls were badly scored due to this foreign matter being in the shipment.
> "We would appreciate your checking into this matter and letting us hear from you as it is of the utmost importance that no foreign matter be found in the GR-S."

By eliminating the cause of such complaints the electronic metal detector can be credited with a significant part in improving the over-all quality of GR-S rubber.

Preliminary Studies

Recurring shutdowns for repairs to equipment in the consuming plants become economically and productively prohibitive. Soon after synthetic rubber became avail-

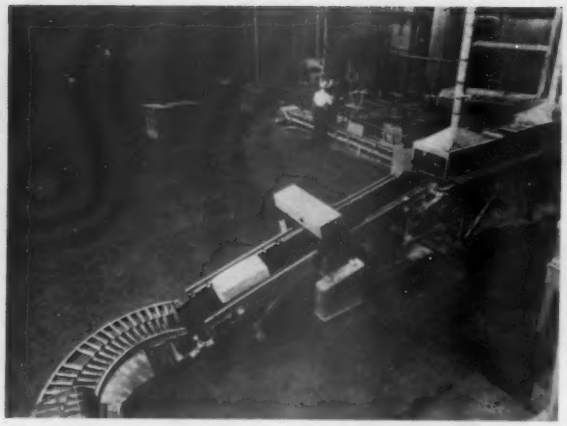

FIG. 1—Over-all view of the bagging department at the Kentucky Synthetic Rubber plant at Louisville. The 12-inch metal detector can be seen in the center over the conveying belt.

able in sizeable quantities, it became apparent that if such shutdowns were to be eliminated, equipment for detecting tramp metal embedded in the finished bale would have to be devised.

One of the early attempts to solve the problem was the installation of magnetic separators and pulleys on the dried crumb conveyor belt. This equipment while having definite value for retrieving free magnetic objects was not the complete answer because: (a) non-magnetic metallic objects were not detected, and (b) when the mass of the metallic object embedded in the rubber was appreciably less than the mass of the rubber itself, the metal was usually not removed.

The field of protection of this equipment was limited to objects having magnetic characteristics. Because of the wide use of non-magnetic metals in processing equipment, tests were made which revealed that 17 pounds of non-magnetic material were found for each 100 pounds of magnetic contamination. The stray non-magnetic material, of course, was just as dangerous to the consumers' processing equipment as the magnetic variety.

The chunks of rubber discharging from the driers average five pounds in weight. Inclusions of small metallic objects such as nuts and bolts, a common form of contamination, would at times remain undetected when enclosed in the chunk of rubber. For small pieces of metal the value of the magnetic equipment was therefore limited to objects not incorporated in the rubber.

Another method of detection considered was the installation of X-ray equipment. Although thought to be better than magnetic separators, the use of such equipment did not appear economically sound for the three following reasons: (1) The high initial cost of X-ray equipment; (2) The continuous cost of qualified operators; (3) The possible health hazard to operators from radiation.

Setting aside as a disadvantage the high initial cost, one serious drawback to the use of this equipment was that, in principle, it depended on the constant efficiency of the operating technicians who would be required to scan the detector screen continuously. Since this type of work is monotonous in nature the efficiency drops off with time and the possibility of bales containing metal being undetected would always exist.

The possibility of damage to the health of the operators from long term exposure to radiation posed an additional problem. Although this factor was somewhat nebulous in nature, it still required consideration. X-ray equipment after careful study was ruled out as being impractical.

It finally became evident that the only solution to the problem was the installation of a fully automatic metal-detecting device that would be effective against both magnetic and non-magnetic metallic particles, regardless of their size or location within the bale. The human element should be eliminated from direct responsibility for the operation to avoid slip-ups due to work fatigue. In addition, in order to reduce operating costs, the unit had to be simple to install, safe to operate, and easy to maintain.

Prior to the time that the Louisville copolymer plant

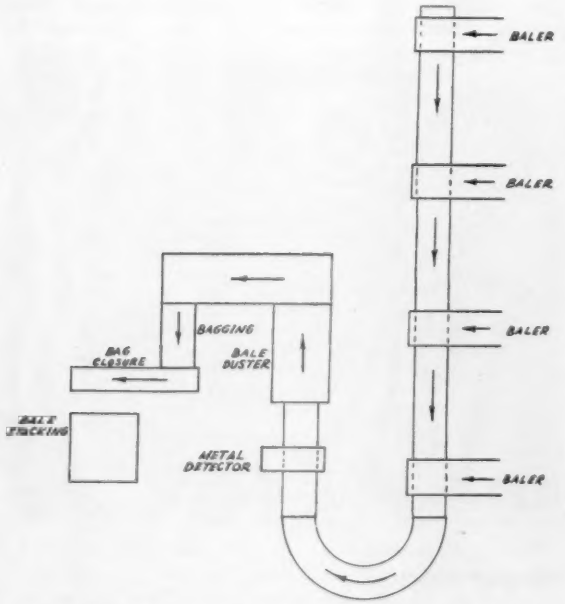

FIG. 2—Schematic drawing of the baling and bagging operations. Note the location of the metal detector between the balers and dusting unit.

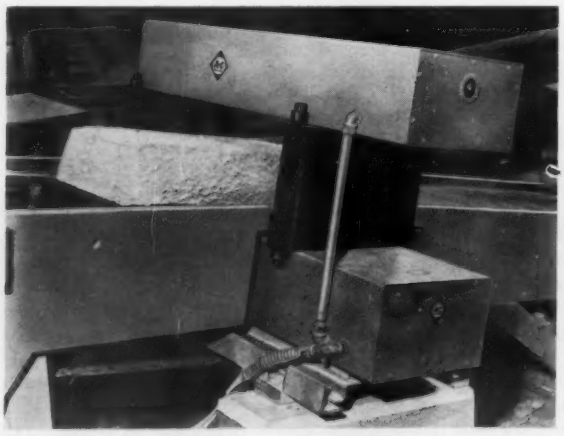

FIG. 3—Close-up view of the metal detector in operation. A synthetic rubber bale is passing through the inspection aperture.

was reactivated in late 1950, much development work had been done by other operators of government-owned synthetic rubber plants on the adaptation of electronic detectors for screening the rubber bales for metallic contamination. Before selecting new detectors for installation at this plant, this backlog of experience was examined on the basis of performance stability and ease of maintenance. As a continuation of the development work on detection equipment, an Allis-Chalmers detector was one of the two electronic units selected for evaluation.

The Operating Standpoint

The Allis-Chalmers unit has proven to be quite stable in operation, ordinarily requiring routine maintenance only. The installation is so engineered that if metal is present within the rubber bale as it passes through the inspection aperture, the control circuit energizes a series of red warning lights and industrial buzzers. Provision is made to automatically stop the conveyor system for sufficient time to allow the operator to remove the suspect bale from the conveyor. The resetting and restarting of the metal detector and conveyor system can be done both manually by means of push button station or automatically by means of a Microflex timer.

The metal-free bales of synthetic rubber after passing through the inspection aperture of the metal detector (Figures 1, 2, and 3) enter a dusting unit where a coating of dusting powder (talc) is applied to the exterior of the rubber bale. The powdered bale is then rammed into a clay-coated multiwall paper bag and is conveyed to the bag closure equipment where an automatic sewing machine stitches the open end of the bag. The sacked rubber bales are then conveyed to the warehouse pending laboratory release for shipment.

The metal detector is also used for isolating the metallic contamination in rejected bales. The process consists of first splitting the bale into two sections and passing them one at a time through the metal detector (Figure 4). The section containing the contamination is again halved and the process repeated until the entire bale has been thoroughly screened and the contamination isolated and removed.

The metallic contamination may cover a wide range of items and it is possible for the producing plant to derive intangible but desirable benefits as a result of the inspection. By recovery and examination of the contaminant, advantageous revisions to equipment and maintenance procedures can be made. The following two cases illustrate this point.

FIG. 4—Rejected bales are split in two and the individual sections are passed through the metal detector. The stray metal is isolated in this manner.

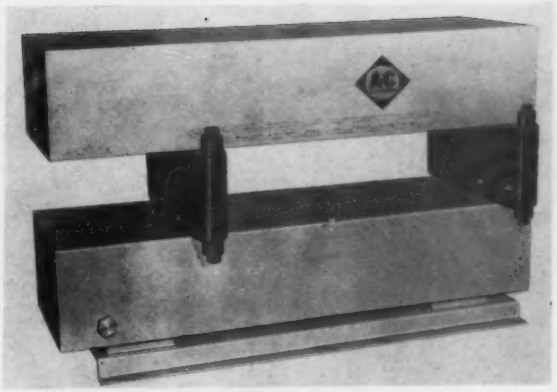

FIG. 5—As indicated in this illustration, a receiver or detector coil is located in the upper head of the detector and two oscillator or field coils are located in the lower head.

On one occasion during the routine examination of exhibits extracted from contaminated bales a surprising number of greasy blobs of rubber were noticed. Laboratory analysis showed a high percentage of iron in the greasy mass. Plant investigation revealed that an enthusiastic worker was overlubricating the rollers which support the moving belts of the drying oven. A sufficient number of the rollers were jammed and were being dragged along the roller track to score off metallic particles which were picked up in the excess grease. This subsequently sloughed off into the rubber stream. This source of contamination was eliminated by revision of the lubrication procedure.

On another occasion a large number of small nuts and bolts were recovered. Investigation revealed that the bolts were those used for attaching baffle plates along the edges of the moving belts. It became evident that these bolts were too light for this service and were being sheared off. Replacement with heavier bolts corrected the condition.

Radio-Frequency Spots Metal

The metal detector is an electronic device designed to guard and assure product purity with respect to stray metal particles. It consists of two box-like compartments separated by specially designed phenolic spacer blocks to form an inspection aperture. As the material to be inspected passes through this aperture, it is continuously screened by a radio-frequency magnetic field. Whenever a stray metal particle, either magnetic or nonmagnetic, enters this radio-frequency field, the resultant disturbance triggers the devices which will operate in a variety of ways to draw attention to, mark, or reject the metal-laden portion or stop the conveyor or processing equipment.

The electronic metal detector is especially applicable to the protection of valuable rolls, extruding screws, tools and dies, molds, engraving rolls, and expensive production machinery in general which are exceedingly difficult to repair or replace. It helps to build and preserve customer good will by assuring products of high quality and purity.

Materials in both the finished and unfinished state, in bulk or packaged form, can now be free of stray metal particles. The metal detector is effective against all

kinds of metal—magnetic or non-magnetic, ferrous or non-ferrous, tin, copper, iron, steel, aluminum, gold, silver, stainless steel, bronze, lead, metal scale, iron rust etc. Metal detectors with special-sized apertures will detect particles as small as 0.039 inch in diameter regardless of how deeply they are embedded in the material.

Features of the Detector

The lower head of the electronic metal detector contains the oscillator unit; the upper head, the detector unit. There are two oscillator or field coils located in the lower head. A receiver or detector coil is located in the upper head, as shown in Figure 5. The oscillator energizes the two lower field coils (see Figure 5) and the resulting radio-frequency electromagnetic rays are transmitted through the inspection aperture. The high-frequency field established by these coils is equal in phase but opposite in direction. Because of this condition of balance the voltage induced in the detector coil will be zero. When metal enters the inspection aperture the field becomes unbalanced and a voltage is induced into the detector coil. This voltage is amplified and fed to a detector tube which triggers the Thyratron tube which in turn actuates control or reject relays operating external devices. Normal operation may be restored either manually by means of a push button station or automatically through a time delay relay. The electronic metal detector may be used on conveyor installations at speeds ranging from 15 to 600 feet per minute with full sensitivity.

The electronic metal detector is completely self-contained and needs only to be plugged into an electrical outlet in order to operate. At 105 to 125 volts, 50 or 60 cycles, only 140 watts of power are consumed, and automatic voltage regulation makes operation independent of normal line voltage fluctuation.

The compartments which house the detection apparatus proper are built of heavy gauge aluminum on a box girder frame. The phenolic spacer blocks are used to mount one compartment above the other, thus forming an inspection opening. The Allis-Chalmers design of these spacer blocks facilitates removal of the metal detector from the conveyor system or the replacement of a long conveyor belt, etc., cutting costly production time down by 90% in comparison with some other models.

The whole assembly is shock-mounted for protection against building and conveyor vibration. It is completely air-tight and as a result is unaffected by dust, dirt, lint, vapors, gases, and liquids. It may be washed down or scrubbed without damage to the sensitive detecting elements. There are no dangers to operating personnel from exposed electrical connections. Control of the equipment is extremely simple. Regular plant personnel may be assigned to operate it and peak performance can be maintained by a simple daily adjustment.

Electronic metal detectors are available in three standard aperture heights of four, seven, and twelve inches to meet various production requirements. Special sized apertures, however, can be built for applications where standard aperture units would not be suitable.

New Texo Process for Cleaning Aluminum Molds and Mandrels

IN the manufacture of many rubber products, one of the critical problems has been that of finding a means of rapidly cleaning aluminum molds and mandrels without damage to the surface of the aluminum. Manual methods of cleaning have proven to be costly because of the many man-hours of labor required and because it is difficult to manually remove stubborn carbonaceous deposits without seriously damaging the mold or mandrel. Organic solvents, for the most part, have proven to be either ineffective or too costly, while alkaline cleaners are relatively slow and must be used with extreme caution lest the aluminum surface be attacked.

Within the past year, a new process has been developed by the Texo Corporation of Cincinnati, Ohio, which, according to the company, is rapid, is completely safe insofar as the aluminum surface is concerned, is reasonably safe for personnel to apply, has minimum requirements for provision of equipment, and which has proven its practical value in plant usage.

The process is one of immersing the mold or mandrel in a 25% solution of a new cleaning material, Texo 3068, at a temperature of 170°F., and following with a water rinse. The time required for immersion varies of course with the amount of carbonaceous deposit to be removed, and in actual applications to date has ranged from 5 to 10 minutes. The process has been in use in one large plant for a period of seven months and in other plants for shorter periods. It has been applied successfully to the manufacture of tires, refrigerator parts, and bathroom accessories.

An important advantage of the process, according to Texo, is that it produces an anodized effect on the surface of the aluminum, and this aids materially in mold or mandrel release. Production costs are said to be reduced in the lowered time required for cleaning, with a consequent reduction in numbers of molds required, reduction in man-hours of labor required, lowered supervisory requirements, and in reduced depreciation of molds and mandrels. Tank equipment only is needed.

Results of the Texo 3068 cleaning process are clearly evident in this section of an aluminum mandrel.

Bibliography of Butyl Rubber

By E. E. McSWEENEY and W. J. MUELLER

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THE following bibliography, the result of an extensive survey, was prepared because no comprehensive listing of Butyl rubber literature has been generally available. It is not intended as a casual summary of the properties of Butyl rubber, since several very good survey articles already exist. Rather, it is meant to be of use to people interested in an exhaustive treatment of specific problems relating to the preparation and use of this type of polymer. Most of the published literature on Butyl rubber is covered, with the exception of articles of popular nature which describe Butyl rubber in general terms.

The bibliography consists of two parts. The first is an index of subjects, with reference to publications pertaining to each. These references are listed alphabetically by authors in the second part of the bibliography.

We acknowledge the assistance of the NEPA Division of the Fairchild Engine and Airplane Corporation, at whose request this survey was made.

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A. Milling (120, 161, 189, 203, 204).
B. Banbury Mixing (10, 105, 120, 161, 236).
C. Extrusion (12, 103, 105, 107, 120, 123, 143, 152, 164, 185, 203, 261, 310, 349, 372, 373).
D. Calendering (10, 12, 120, 123, 203).
E. Splicing (41, 142, 281, 358).
F. Sticking (247).
G. Scorch (27, 72, 106, 107, 120, 165, 312, 313, 335, 336, 337, 346).
H. Nerve (12, 61, 185, 204, 271).
I. Heat Treatment (Hot Milling before Curing) (144, 206).
J. Dispersion of Carbon Black (91, 128, 129, 225).

V. Physical Properties of Vulcanizates

A. Stress-Strain and Hardness (Room Temperature):
1. Gum Stocks (12, 20, 148, 280, 317, 321, 354).
2. Carbon Black Stocks:
a. Channel (72, 78, 79, 80, 82, 102, 103, 104, 105, 106, 107, 108, 120, 144, 153, 164, 165, 173, 203, 219, 276, 280, 307, 309, 310, 330, 331, 334, 335, 337, 346, 349, 350, 354, 355, 378).
b. Furnace (12, 29, 32, 49, 72, 78, 79, 81, 103, 104, 105, 106, 107, 115, 117, 120, 123, 164, 173, 178, 179, 180, 217, 246, 276, 313, 314, 328, 330, 334, 335, 336, 346, 349, 359, 376, 378).
c. Thermal (27, 32, 78, 79, 81, 103, 105, 120, 164, 173, 178, 276, 330, 376).
d. Acetylene (47, 79, 80, 104, 157).
3. Nonblack Stocks:
a. Silene (81, 120, 164, 173, 364, 376).
b. $CaCO_3$ (78, 81, 120, 164, 335, 376).
c. Clay (81, 120, 173, 335, 376).
d. Other (83, 164, 234, 360).

B. Stress-Strain and Hardness (Elevated Temperature) (12, 55, 56, 58, 72, 120, 227, 313, 330, 331, 354).

C. Aged Stress-Strain:
1. Air Oven (12, 120, 164, 178, 203, 204, 219, 248, 280, 313, 317, 330, 331, 334, 335).
2. Oxygen Bomb (120, 164, 248, 280, 330, 331, 335).

D. Tear Resistance:
1. Carbon Black Stocks (12, 47, 65, 79, 81, 102, 103, 104, 105, 107, 117, 120, 157, 164, 165, 173, 178, 179, 180, 261, 280, 317, 330, 334, 355, 359).
2. Nonblack Stocks (66, 81, 83, 120, 164, 173, 234, 360, 364).

E. Flex Cracking (22, 67, 107, 280, 290, 303, 317, 331, 355).
F. Hysteresis (59, 106, 120, 164, 221, 317, 331).
G. Abrasion Resistance (12, 79, 80, 102, 103, 104, 144, 280, 290, 303, 317, 331).
H. Rebound Resilience (1, 12, 22, 47, 57, 78, 79, 80, 102, 104, 105, 106, 164, 178, 180, 184, 197, 229, 263, 280, 308, 313, 317, 330, 331, 334, 355, 359).
I. Heat Buildup (Goodrich Flexometer) (12, 22, 78, 79, 92, 102, 103, 104, 105, 117, 123, 164, 165, 280, 307, 309, 313, 314, 330).
J. Permanent Set (7, 79, 120, 164, 234, 313, 330).
K. Compression Set (39, 117, 120, 164, 178, 179, 180, 217, 219, 263, 313, 317).
L. Low-Temperature Properties:
1. Brittle Point (191, 201, 207, 223, 280).
2. Low-Temperature Stiffness, Young's Modulus, Torsional Modulus, Low-Temperature Retraction (38, 141, 154, 202, 207, 222, 224, 285, 286, 288, 355).

M. Hot Flow, Creep (47, 85, 156, 157, 165, 313).
N. Electrical Properties (47, 68, 72, 80, 103, 104, 128, 144, 172, 209, 214, 225, 294, 317, 331).
O. Stress-Relaxation (39, 198, 215, 265, 327, 362).
P. Retraction Rate (1, 54, 228, 295).
Q. Dynamic Properties (170, 264, 361, 378).
R. Gas Permeability (12, 35, 87, 94, 123, 164, 284, 301, 317).

VI. Chemical Properties

A. Acid and Alkali Resistance (164, 219, 317, 331, 355).
B. Solvent and Oil Resistance (124, 125, 127, 158, 164, 195, 219, 270, 273, 280, 299, 331, 374, 376).
C. Effect of Metals (36, 135).
D. Effect of H_2S and S_2Cl_2 (25, 293, 363).
E. Water Absorption (238, 317).
F. Oxygen Absorption (248).
G. Chemical Analysis:
1. Degree of Unsaturation (20, 89, 139, 164, 188, 200, 255, 257, 353).
2. Peroxide Content (268).
3. Carbon Black Content (37, 140, 196, 208, 213).
4. Sulfur Content (Free and Combined) (79, 256, 375).
5. Ozonolysis (5, 254, 375).
6. Identification (9, 34, 69, 70, 239, 240, 333).

VII. Forms Available (Other Than Dry Polymers)

A. Aqueous Dispersion (62, 266, 315, 316, 339, 340, 342).
B. Cellular (283).
C. Reclaim (71, 107, 190, 216, 244).

VIII. Application

A. Inner Tubes (1, 49, 64, 110, 112, 165, 176, 204, 301).
B. Tires (135, 146, 300).
C. Fabric Impregnation and Coating (131, 135, 181).
D. Airbags (88, 115, 133, 165, 234, 235, 276, 302, 334, 341).
E. Cements (30, 45, 101, 153, 155, 161, 181, 183, 194, 269, 363).
F. Adhesion to Other Surfaces (26, 31, 95, 171, 174, 187, 205, 251, 275, 287, 344).
G. Electrical Applications (Insulation, Transformers) (60, 192, 193, 250).
H. Miscellaneous (77, 132, 135, 159, 168, 242, 289, 324, 325, 329).

IX. Unclassified

A. Vulcanization (Theory, Kinetics, Stoichiometry) (63, 149, 375, 376, 377)
B. Effect of Microorganisms (50, 51, 52, 347).
C. Friction on Ice (84)

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Factors Influencing the Utility of Neoprene Solvent Adhesive Cements

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ELASTOMERIC cements fundamentally consist of only two parts, the polymer and the solvent. However, there are many variables which must be considered in the preparation of practical cements. Although the kind of solvent or combination of solvents used is an important factor, this variable is outside of the scope of the work reported in this paper. Among the more important properties of the base compound are its solubility and stability, its cohesive strength, its effect on materials which it contacts, the tack retention of its films, its heat resistance, and its ability to adhere to a variety of surfaces. The more important properties of the cements themselves which must be taken into consideration are their stability and viscosity.

While there are a number of elastomers which can be used satisfactorily for the manufacture of solvent adhesive cements, the work reported in this investigation will deal exclusively with those made from neoprene and specifically with those made from Types AC, WRT, W and WHV.

Neoprene Type AC is a polymer which crystallizes rapidly, resulting in high cohesive strength, and therefore it is used where the ultimate in bond strength is desired. Its films, however, have short tack retention periods. Type WRT crystallizes very slowly and because of this slow freeze, films of Type WRT have long tack retentions. They have good cohesive strength but not so good as that of Type AC. Type WRT may be used alone or in blends with Type AC to improve the tack retention of the latter. Type W is similar to Type WRT but has cohesive properties which are intermediate to those possessed by Types AC and WRT. Type WHV is similar to Type W, differing chiefly in that it is less plastic. As a consequence, its cements have a high viscosity to solids content ratio. It is used chiefly with blends of Type AC to control viscosity, although it may be used alone if very high viscosity cements are desired.

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TABLE I—THE EFFECT OF TYPE OF NEOPRENE AND OF COMPOUNDING INGREDIENTS ON THE COHESIVE STRENGTH OF NEOPRENE FILMS

(Parts by Weight)

Neoprene	100	100	100	100
Magnesium Oxide	...	4	4	4
Zinc Oxide	...	5	5	5
Antioxidant	...	1	1	1
Phenol Formaldehyde Resin (Resin BR-14634)	...	...	45	...
Coumarone Indene Resin (Cumar RH)	...	...	...	45
Cohesive Strength—Canvas to Canvas (lb. per linear inch)				
At 23.9°C. (75°F.)				
Type AC	50	75	100	40
Type W	20	30	45	15
Type WRT	10	15	45	10
At 60°C. (140°F.)				
Type AC	0	7	32	0
Type W	0	2	15	0
Type WRT	0	0	9	0

TABLE II—THE EFFECT OF MILLING ON THE COHESIVE STRENGTH OF NEOPRENE CEMENT FILMS

(Parts by Weight)

Neoprene Type AC (milled)	100	...
Neoprene Type AC (unmilled)	...	100
Magnesia	4	4
Antioxidant	1	1
Zinc Oxide	5	5
Toluene	—to 25% solids—	
Cohesion—Canvas to Canvas (lb. per linear inch) Warmed to 70°C. (158°F.) and Tested		
At 23.9°C. (75°F.) After		
1 Minute	4	10
30 Minutes	8	16
8 Hours	16	18
24 Hours	45	26
At 60°C. (140°F.) After		
10 Minutes at 60°C.	2	10

Solubility

Unlike natural rubber, which must be subjected to mechanical action before it will produce smooth cements, all of the neoprene types mentioned above, except Neoprene Type AC of higher than normal Mooney viscosity, will produce smooth cements without milling. The solubility of all types may be increased by milling. Milled compounds of these types are very soluble and comparatively high solids content solutions may be obtained.

Stability of Polymer and Compound

Neoprene Types W, WRT, WHV and AC are all stable in storage and satisfactory cements have been made from polymers which have been aged at ambient temperatures for as long as two years.

The stability of a neoprene cement base compound is dependent upon the compounding ingredients used as well as on the type of neoprene. As a rule, the base compound is considerably less stable than the cement made from it.

One common method used to determine stability consists of the following simple experiment: Strips of can-

TABLE III—THE EFFECT OF RESINS ON ADHESION OF NEOPRENE TO VARIOUS MATERIALS

(Parts by Weight)

Neoprene Type AC	100	100
Magnesia	4	4
Zinc Oxide	5	5
Antioxidant	1	1
Heat Reactive Phenolic Resin	...	45
Adhesion at 23.9°C. (75°F.) (lb. per linear inch) to		
Cotton Fabric	50	100
Nylon Fabric	2	25
Dacron Fabric	2	25
Steel	7	50
Glass	6	45
Lucite	20	55
Formica	5	45

vas are coated with cement and dried. These coated strips are then aged in an air oven at an elevated temperature. The limit of stability is taken arbitrarily as the time when there is a loss in bond strength between two strips of the canvas which have been heated for two minutes at 150°C. and combined by rolling them together while still warm.

Using this procedure, a stability of one month at temperatures of 38°C. (100.4°F.) is considered to be excellent. This long stability, however, is required only in a few applications, such as the permanent attaching of soles to shoes. In this application, the cement is applied to the sole which is then dried and may be stored as long as two weeks before being used. In most applications, the cement is applied and dried only to tackiness before the bonds are made and in such applications the stability of the dried film is of minor importance as long as the stability of the cement itself is satisfactory.

Cohesive Strength

The cohesive strength of a neoprene adhesive cement film will depend upon the type of neoprene used, upon the compounding ingredients added, upon the temperature of service, and upon the method used for preparing the cement. Films of Type AC have the greatest cohesive strength, followed by Type S, WHV, W and WRT in that order.

Regardless of the type of neoprene employed, certain compounding ingredients must be added to the polymer to insure satisfactory performance. The most important of these are antioxidants and acid acceptors which must be employed when the cement is used in contact with materials which are susceptible to attack by traces of hydrogen chloride. The most common acid acceptors are metallic oxides, such as magnesia and zinc oxide. Recent work has shown that certain heat reactive phenol formaldehyde resins also play an important role as acid acceptors.

The effect of varying these ingredients on the cohesive strength of the films is shown by the data given in Table I.

The heat reactive phenol formaldehyde resin, which melts at approximately 93°C. (200°F.), reacts with the magnesia to form a resinous product which has no melting point, but decomposes at approximately 232°C. (450°F.). It is believed that this modified resin acts to give the excellent cohesive strength of neoprene films at elevated temperatures. The results on similar films containing a coumarone-indene resin show that thermoplastic resins decrease the cohesive strength at both room and elevated temperatures.

The cohesive strength is also affected by the method used to prepare the cement. For example, if it is made from unmilled polymer, the deposited film will have greater original cohesive strength than will one made from milled neoprene. It will also have greater strength at elevated temperatures. However, the film made from the milled polymer will freeze more rapidly and to a greater extent, as indicated by the results in Table II.

Adhesion

Neoprene films will adhere readily to such porous surfaces as cotton fabric and leather without special compounding. They will also adhere fairly well to Lucite acrylic resin and some other solid plastics. They will not adhere to nylon or Dacron polyester fiber fabrics, nor to solid non-porous materials, such as metals, glass, hard rubber, phenolic resins and vinyl plastics, without special compounding. To obtain good adhesion of neoprene to nylon or Dacron fabric, it is necessary to pretreat the fabric with a polyisocyanate such as Hylene M (methylene bis 4-phenyl isocyanate) in a very dilute solvent solution or in a neoprene solution before applying the neoprene film. Another method of obtaining good adhesion to these materials and to other solid non-porous materials is to add certain resins such as terpene-phenolics or other modified phenolics to the cement in amounts up to 100% based on the neoprene. Data illustrating the use of resin are listed in Table III.

TABLE IV—BLENDS OF NEOPRENE TYPE AC AND W IN CEMENTS

(Parts by Weight)

Neoprene Type AC	100	75	50	25	0
Neoprene Type W	0	25	50	75	100
Magnesia	4	4	4	4	4
Zinc Oxide	5	5	5	5	5
Antioxidant	1	1	1	1	1
Toluene	327	327	327	327	327
Tack Retention (hr.)	0.5	2	5	24	>48
Adhesion—Canvas to Canvas (lb. per linear inch)					
At 23.9°C. (75°F.)	56	60	58	55	18

TABLE V—THE EFFECT OF COMPOUNDING INGREDIENTS ON TENDERING OF RAYON BY NEOPRENE CEMENTS

(Parts by Weight)

Neoprene Type AC	100	100	100	100	100	100
Magnesia	...	...	4	4	4	4
Zinc Oxide	...	...	...	...	5	5
Resin BR-14634	...	45	...	45	...	45
Antioxidant	...	1	1	1	1	1
Toluene	To 25% Solids					
Rayon Deterioration—% Tensile Strength Retained (After Aging in Weather-Ometer)						
Days						
0.3	36	88	79	100	98	102
0.7	13	63	48	103	74	110
1	5	52	35	96	64	98
2	0	27	29	84	42	97
4	...	0	0	73	23	92

TABLE VI—THE EFFECT OF COMPOUNDING INGREDIENTS ON THE STABILITY OF NEOPRENE CEMENTS

(Parts by Weight)

Neoprene Type AC	100	100	100	100
Magnesia	...	4	4	4
Zinc Oxide	...	5	5	5
Antioxidant	...	1	1	1
Silene EF	...	...	10	10
Durez Resin No. 12603	...	...	...	10
Aged in Glass at 70°C. (158°F.)				
Days to Gel	>60	7	12	18

TABLE VII—STABILITY OF CEMENTS MADE FROM VARIOUS TYPES OF NEOPRENE

(Parts by Weight)

Neoprene Type AC	100	...	...
Neoprene Type W	...	100	...
Neoprene Type WRT	...	...	100
Magnesia	4	4	4
Zinc Oxide	5	5	5
Antioxidant	1	1	1
Toluene	—— To 20% Solution ——		
Aged at 70° C. (158°F.) in Glass			
Days to Gel	7	18	20

By pretreating nylon and Dacron with Hylene M, adhesions up to 50 to 60 pounds per linear inch can be obtained. If Hylene M is added to neoprene cement, this cement will adhere fairly well to vinyl plastics.

Tack Retention of Films

Two methods are commonly used in the application of neoprene adhesive cements. One is to apply the cement to both surfaces and allow it to dry completely. Bonds are then made by reactivating either one or both surfaces with heat and pressing them together. The second method consists of applying the cement to both surfaces, allowing it to dry to tackiness, and then combining. In the first of these methods, the tack retention of the cement is not important, but in the second, careful attention to this property must be given if best results are to be obtained.

In the heat activation method, Type AC cements may be satisfactorily used, but in the second method, which depends upon the pressure sensitivity of the dry films, Type AC cements are not generally satisfactory, especially if more than 30 minutes of tack retention is desired.

The tack retention of Type AC cement can be increased by the use of resins, but this method results in an excessive decrease in cohesive strength of the film which, of course, is undesirable.

The tack retention of a neoprene cement may be varied from ½ hour to longer than 48 hours by the use of blends of Type AC and either Type W or WRT. The effect of using various amounts of Type W in Type AC cements on tack retention and on adhesion is shown by the data in Table IV.

These results show that increasing the ratio of Type W to Type AC in a cement greatly increases the length of time the film remains tacky without affecting the apparent cohesive strength of the film. It was only when Type AC was replaced entirely by Type W that a definite decrease in cohesive strength was noted. In this case the tack retention time was increased to well over 48 hours. Similar results were obtained with blends of Type WRT with Type AC.

Fabric Deterioration

As was stated above, recent work has indicated that certain phenolic resins have a very beneficial effect in minimizing the deteriorating effect of neoprene cements on acid-sensitive fabrics. The data summarized in Table V illustrate the effect of metallic oxides and a typical heat reactive phenolic resin, either alone or in combination, on this property.

These data show that the cement containing 4 parts of magnesia, 5 parts of zinc oxide, and 45 parts of resin had little effect on the fabric after 4 days' exposure in the Weather-Ometer. They also show that the cement with the magnesia and resin is better than the one containing magnesia and zinc oxide. The gum compound deteriorated the fabric 64% in 8 hours, but only 12% when the resin was added. When used alone, magnesia and resin are about equivalent in providing resistance to fabric deterioration. In all fabric deterioration tests a 0.020-inch wet film was applied to the fabric and dried at room temperature before starting the aging in the Weather-Ometer.

Stability of Cements

If an adhesive cement is to be used satisfactorily, it must remain stable in viscosity, which controls the ease of application, and in can life and color.

In the presence of iron (drums), cements made from neoprenes which contain a thiuram disulfide as a stabilizing agent have a marked tendency to discolor on storage. All of the neoprenes employed in this investigation except Type AC are characterized by the absence of this stabilizing agent.

It was found that the discoloration of neoprene cements by iron can be minimized by the use of acid acceptors, such as magnesia and zinc oxide. However, cements containing them tend to gel prematurely, especially if storage is at elevated temperatures. Neoprene cements containing magnesia and zinc oxide can be stabilized to a considerable extent by incorporating approximately 10 parts of hydrated calcium silicate, based on the neoprene. This material not only stabilizes the cement but increases the cohesive strength of the film several-fold. While this technique has been satisfactory

TABLE VIII—THE EFFECT OF NEOPRENE TYPE WHV ON TYPE AC CEMENTS

(Parts by Weight)

Neoprene Type AC	100	90	80	50
Neoprene Type WHV	...	10	20	50
Magnesium Oxide	4	4	4	4
Zinc Oxide	5	5	5	5
Antioxidant	1	1	1	1
Toluene	433	433	433	433
Viscosity (cps)	2400	6000	8000	13,000
Adhesion—Canvas to Canvas (lb. per linear inch)				
At 23.9°C. (75°F.)	17	20	20	19
At 60°C. (140°F.)	2	5	6	8
Tack Retention (hr.)	0.5	3	4	6

with cements made from Neoprene Types GN, GN-A and CG, it has to be modified somewhat for use with those made from Neoprene Types AC, W, WRT and WHV. With these types, hydrated calcium silicate causes thixotropy. The addition of approximately 10 parts of a phenolic resin, such as Durez 12603 or Bakelite BR-14634, destroys the thixotropy.

The effect of various compounding ingredients on the stability of neoprene cements is shown by the data in Table VI. Adhesive cements made from Neoprene Type W or WRT are considerably more stable than similar cements made from Neoprene Type AC, as indicated by the results shown in Table VII.

Viscosity

Viscosity must be controlled accurately in order that the cement functions satisfactorily. A convenient method for controlling this property is to vary the solids content, but it is not always practical because such variation may affect bond strength.

A satisfactory method for controlling the viscosity of a neoprene cement without changing the solids content of the cement or appreciably affecting the cohesive strength of the film is to replace part of the Type AC with Type WHV. Neoprene Type WHV is a sol polymer and it can be used with any type of neoprene to make high viscosity cements.

The results obtained by substituting varying amounts of Type WHV in typical Neoprene Type AC cements are listed in Table VIII. These results show that the addition of Type WHV to Type AC cements not only increases the viscosity and tack retention but also increases the elevated temperature cohesive strength without affecting the cohesive strength at room temperature.

Problem of Shrinkage in Closed Cell Rubber Goods

RESIDUAL shrinkage in closed cell rubber goods occasioned by the diffusion of the inflating gas through the cell walls is a pertinent problem and the following data furnished by Dr. R. J. Noble, vice-president in charge of research and development of Rubatex Products, Inc., who maintains headquarters at the laboratories at 27 Upham Street, Melrose 76, Mass., should prove of some value in overcoming this problem.

Because the details of operation may vary greatly as between different factories, the answer to the problem of shrinkage can be given only after a study of all the factors appearing in any particular case. Some shrinkage is unavoidable and may result from at least two distinct causes. Hot expanded closed-cell articles shrink as they cool, for exactly the same reason that an inflated balloon contracts as the gas within it is cooled. A second cause of shrinkage, slower in producing its effect, is the diffusion of the inflating gas through the cell walls. The extent to which such diffusion takes place depends upon the nature of the inflating gas, the composition and permeability of the cell walls, the state of vulcanization and other factors.

Residual shrinkage as experienced in most factories may be classified as variable and/or uniform. The latter indicates insufficient heat treatment after the initial cure and expansion. If the initial cure has been very short, additional heating at a curing temperature, either in the press or oven, may be required. If the cure is well advanced, increasing the time of heating at a normalizing temperature (220-240°F.) will be sufficient.

On the other hand, variable shrinkage is generally due to variations in the processing procedures. Control of shrinkage should begin with the mixing operation and continue through all the subsequent steps. It does not depend upon any one factor, but rather upon maintenance of a uniform procedure throughout.

If, for example, difficulty is experienced in obtaining uniform expansion at the press, it is to be expected that the sheets or other items so produced will also show a variable degree of shrinkage. Both conditions result from the same cause, non-uniformity of the press cure, either as between two or more presses or in the several decks of a multi-platen press. Such non-uniformity of cure may result from poor control of platen temperatures and/or too short (and therefore variable) a curing cycle, if multi-platen presses are used.

In general, the elapsed time between the initial cure and the subsequent heat treatment whether in a press or oven, is not critical. Some variation in time due to movement of goods through the factory may be unavoidable. However, once a practice is established it should be maintained as uniformly as conditions permit.

The time and temperature required for the secondary heat treatment of any stock must be determined by trial, since both are dependent upon several factors—the formulation used, the state of cure developed at the press, etc. If a minimum initial cure has been given, it is usually necessary to begin the secondary heat treatment at a temperature sufficiently high to complete the cure, this being followed by an additional heating at a lower temperature and for a time sufficient to effect shrinkage and stabilization. Both the time and temperature schedule required will depend upon whether the second heat treatment is done in a press or an oven or both.

In the oven method, special precautions must be observed if variations in shrinkage are to be avoided. If the oven is overloaded or if sheets are closely packed so that circulation is inadequate, the shrinkage will be highly variable and usually much less than desired. Because of the insulating properties of expanded rubber, a suitable period must be allowed for the interior of the sheets to come up to temperature; this will depend upon their thickness and the actual oven temperature. To obtain maximum shrinkage, several hours, after full temperature rise, may be required. The minimum time requirement must be determined by test but, once determined, may be fixed provided the other above-mentioned variables are also fixed.

If the secondary heat treatment is done in the press, the time required is much shorter, because of the higher temperatures that may be employed and because of better heat transfer. However, it is often necessary, if residual shrinkage is to be reduced to a minimum, that the press treatment be followed by at least a short period at a lower temperature. While the use of the press for secondary heating has many advantages, some plants do not have the necessary press capacity for large production by this method.

Although no standard test for determining residual shrinkage has been adopted, several tests involving the use of a die-cut sample, subjected to an elevated temperature for a period of 24 to 72 hours, have been used. Because of the relatively large surface-to-mass ratio in a strip 1-inch x 12 inches, heating at 220°F. for as short a period as 24 hours is sufficient to indicate whether the material will be subject to further shrinkage.

Observations and Reflections on the European Rubber Manufacturing Industry

(Continued from Preceding Issue)

By M. E. LERNER
Editor, RUBBER AGE

SOON after the end of the Third Rubber Technology Conference, which was held in London, I took off on a 750-mile tour of England driving a Ford Consul, the British equivalent of our own American-made, four-door Ford sedan. This method of transportation gave me an excellent opportunity to visit a number of rubber factories and laboratories in the western, northern and eastern sections of England and to see the beautiful English countryside at the same time. It is a form of transportation I heartily recommend to anyone who would like to make contact with the British people themselves.

The first stop on this tour was at famed Fort Dunlop, which is approximately six miles out of Birmingham and which was directly preceded by a visit to Stratford-on-Avon where the Dunlop Rubber Co., Ltd., acted as host at a delightful dinner at the Shakespeare Hotel and at a memorable performance of "Romeo and Juliet" at the Shakespeare Memorial Theatre. During my visit to Fort Dunlop and to the Dunlop Research Center, I had interesting talks with a number of Dunlop people including Messrs. Murphy, Madge, King, Davey, Illingworth and Patterson. Adequate descriptions of Fort Dunlop and the Dunlop Research Center or a summary of my talks with various Dunlop personnel would require far more space than available, but some of the following comments may prove of interest.

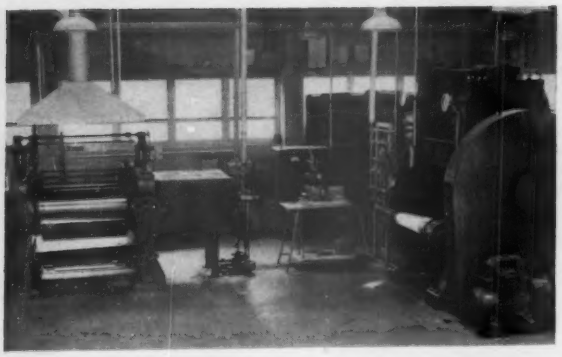
The Dunlop Research Center was officially opened in 1950. It was formerly an aircraft factory and its size can be appreciated by the fact that it contains more than 154,000 square feet of working area. It consists primarily of three buildings, one devoted to research, another to engineering services and the third utilized as a pilot plant. It covers an area of almost eight acres. The buildings are modern, of brick and steel construction, with reinforced concrete floors. The Research Building is a two-story affair with most of the heavy equipment naturally on the lower floor. It is exceptionally well-lighted throughout and has an attractive color scheme with cream dominating both the walls and the plastic tiling.

View of the modern, two-story, brick-and-steel research building which forms part of the Dunlop Research Center near Birmingham. There are some 50 different laboratories in this building.

View of the building occupied by Rubber Technical Developments, Ltd., at Welwyn Garden City, the activities of which were described last month.

Each floor of the Research Building has its own ventilation system, but a separate air-conditioning unit provides constant temperature and humidity conditions in both the rubber and textile testing laboratories. In all, there are some fifty different laboratories in the building, all separated on a functional basis. Some 300 people are employed, over one-third of whom hold university degrees.

The work of the Dunlop Research Center is divided roughly into research and development, with F. G. W. King heading the former and E. A. Murphy the latter. The research activities in turn are divided into four major categories, namely, chemical, compounding, physical and testing. Specific duties are assigned for each of these activities. For example, chemical research work, which comes under the jurisdiction of Dr. W. C. Davey, includes the preparation and fundamental studies of high polymers, chemical derivatives of rubber, studies relating to rubber latex, and kinetics of the major manufacturing operations. Of particular current interest is a laboratory for the use of radioactive isotopes where a good deal of work is being done with Carbon-14 and Sulfur-35.



Some of the equipment used by RTD is seen in this illustration. This organization works closely with the British Rubber Producers' Research Association.

S. C. Stokes, personable superintendent of Rubber Technical Developments, Ltd., charged with development work.

It would be easy to write thousands of words on the other activities of the Dunlop Research Center, including the work on compounding research done by Dr. D. Parkinson, that on physical research by E. F. Powell, on textile fibers by Dr. J. W. Illingworth, on tire design by L. J. Lambourn, and on development work by E. W. Madge and H. F. L. Jenkins, but it will have to suffice to state that the Dunlop Research Center is the research nerve for all of the Dunlop factories which now number some 45, of which 25 are in England itself.

Activities at Fort Dunlop

As for Fort Dunlop, it consists of a large number of factories which sort of grew up like Topsy and cover a vast area. Almost every conceivable type of rubber product is manufactured in one or more of the numerous factories which make up the Fort and in almost every instance the equipment has been modernized to match that seen in our own rubber plants. Of unusual interest in connection with tire and tube production is a bank of eight plastometers used in the control laboratories for uniform Mooney tests.

A constant stream of new rubber products emanates from Fort Dunlop and considerable attention is being paid at the moment to the production of a varied line of rubber-resin products. Included among such products are wheelbarrow bodies, buckets of all kind, barrels, coal scuttles, cement mixer hoppers, wastebaskets and feeding bowls for livestock. Most of these products, including the large size moldings, offer corrosion resistance, toughness, flexibility, lighter weight and unusual shape-retaining strength. Most of the large size moldings are made from special jigs and assembled by hand.

It is now a matter of record that the Dunlop organization is proceeding with plans for the manufacture of its own synthetic rubber in England. A GR-S type of rubber will be produced in a plant to be constructed close to Fort Dunlop and the necessary butadiene will be secured from Imperial Chemical Industries, Ltd. Present plans call for the production of 2,500 tons per year, but it is no secret at the Fort that the company aims for considerably larger production within the next few years.

Goodyear Plant at Wolverhampton

The next visit on the itinerary was to the plant of the Goodyear Tyre and Rubber Company at Wolverhampton, about 45 miles northwest of Birmingham. This plant, which is part and parcel of the Goodyear worldwide organization, has been in operation since 1927 and is under the direction of Howard L. Ginaven, as plant manager. It is patterned on the Akron tire plants and all types of tires and tubes are produced, including the new tubeless tires. The production of earthmover tires

Aerial view of the Goodyear Tyre plant at Wolverhampton. The original plant was constructed in 1927 and some of the newer buildings, especially on the right, can be clearly seen.

Howard Ginaven, plant manager of Goodyear Tyre at Wolverhampton, checking a view of the factory in his office with M. E. Lerner, editor of RUBBER AGE.

View of the analytical laboratory of the R.A.B.R.M. at Shawbury. Work in this laboratory is under the jurisdiction of the Technology Division.

Some of the 80,000 books, periodicals, pamphlets and other literature amassed by the R.A.B.R.M. is seen in this view of the library at Shawbury.

is of major importance in this plant. This can best be realized by pointing up the fact that there are 400,000 tractors in use on the farms of Britain, which means one tractor to every 58 arable acres. In this respect, Britain is said to be the most highly mechanized country in the world.

Tire testing methods at the Wolverhampton plant are equivalent to those found in most major tire factories. Wolverhampton, however, is especially proud of its five-ton test truck which is fitted with a specially designed body for road testing purposes. The body is divided into various compartments in order that the load may be dispersed accurately according to the size of tire and percentage overload used in each individual test. Loads consist of fifty-pound bags of gravel and the payload is varied between 3½ and 5½ tons with weight remaining constant for the duration of each individual test. The planned route for each run covers a 200 mile round trip. This is run twice daily, giving a weekly mileage of over 2,000 miles.

Like most major manufacturers in Britain, British Goodyear maintains a large sports pavilion and a tremendous sports field. An idea of the size of the latter can be secured from the fact that two football matches, one Rugby game and one hockey game can all be played on the field at the same time. The sports ground also contains a cricket field, tennis courts, bowling grounds and an archery range. The cricket field has been the scene of first-class competition.

Research Activities at Shawbury

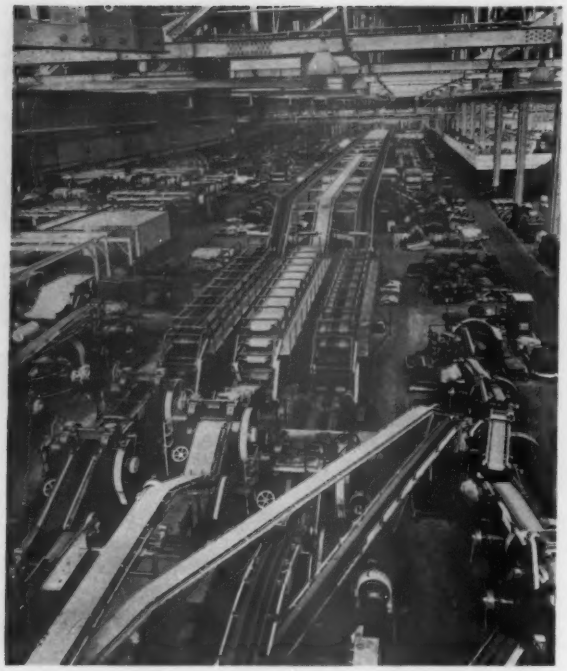
Continuing in a northwestern direction, we next came to the new quarters of the Research Association of British Rubber Manufacturers at Shawbury near Shrewsbury in Shropshire County. Shrewsbury is practically on the Welsh border. The association, which is familiarly known by the abbreviated form of R.A.B.R.M., moved to Shawbury last year after having spent 31 years in Croydon. As a matter of fact, the official dedication of the laboratories at Shawbury will take place later this month, with the Duke of Edinburgh presiding at the dedication.

Unlike the British Rubber Producers Research Association at Welwyn Garden City, which is supported by the rubber producing industry, the R.A.B.R.M. secures its support from the British rubber manufacturing industry, with a financial assist from the British Government. It was organized in 1919, conducted its initial operations at University College in London, and acquired its own premises in Croydon in 1922. It now has some 300 members and its staff numbers approximately 100, including 15 graduate chemists and 6 graduate physicists. Practically all of its efforts are devoted to activities concerned with the manufacture of rubber goods.

The major work of the R.A.B.R.M. is concentrated in its Technology and Intelligence Divisions, both of which are under the direct supervision of Dr. J. R. Scott, who bears the title of director of research. The work of the association is brought to the notice of members through various means, including actual visits by senior members of the laboratory staff, resulting in a liaison effort which is unequalled by any other research association.

The Technology Division, headed by R. C. Moakes, is responsible for general services in all of the laboratories, for much of the representation on various technical committees, and for the greater portion of the liaison visiting service. It is organized in three main sections, one dealing with technological projects, another with special consultation work called for by member companies, and the third charged with maintenance. Current research activity is concentrated on filler reinforcement, oxidation and ozone attack on vulcanized

Close-up view of the front of the administration building of Goodyear Tyre at Wolverhampton. Note the spacious approach to the entrance of the building.



Straight flow line production is the outstanding feature of the Dunlop plant at Speke. This unusual layout is admirably depicted in this illustration.

rubber, dynamic properties of vulcanized rubber, and adhesion of rubber to textiles. Considerable work has also been done in recent years on the development of fireproof rubbers, which is of particular interest at the moment in England where conveyor belts used in mines are concerned. Mixtures of natural rubber and vinyl-vinylidene copolymers have been worked out which look quite interesting and which are undergoing extensive commercial tests. Fireproof compounds for use in cables, flooring and sponge have also been developed and are currently being tested.

Because of the nature of its work, the Technology Division spends a good deal of its efforts on the development of physical and chemical methods of testing both vulcanized and unvulcanized rubber, many of which have been accepted as standards. Its work on hardness testing has achieved international recognition and the association has cooperated with various manufacturers in the design of dead-load and spring-loaded pocket instruments. For a short time during World War II hardness meters were manufactured by the division. Investigations of current tests include those for exposure cracking and stress relaxation. In passing, it is interesting to note that many of the processing units used by the Technology Division at Shawbury are of German make and have been loaned to the association by the British Ministry of Supply.

Work of the Intelligence Division

The Intelligence Division, headed by T. H. Messenger, is devoted to harnessing the documentary resources of the world to the service of the member companies. To achieve this aim, it collects, organizes and disseminates data of pertinent interest to the rubber manufacturing field. Its monthly abstract journal, formerly known as *Summary of Current Literature* and now known as *Rubber Abstracts*, is the best known periodical issued by the division, but it also distributes several other monthly bulletins, including the "Rubber Patent and Trademark Review," "Rubber Economic Intelligence," and "Rubber Trade Developments." In addition, it issues special information circulars at irregular intervals which are comprehensive and systematic literature reviews of specific aspects of rubber science, technology or economics. These are frequently prepared as a result of a direct request from one of the member companies.

The major arm of the Intelligence Division is its library which was organized in September, 1920, and has grown steadily to the point where it is now acknowledged to be the most complete rubber library in the world. It now contains some 80,000 books, pamphlets and volumes of periodicals and includes a card index system classifying all of the rubber and plastics literature available. This index system now comprises approximately 650,000 cards and the division is now working with other rubber research organizations to develop a standard system of classification.

Through the years, the library has collected numerous historical books on rubber, many of them bearing the authors' signatures. Included among these books is "Relation abrégée d'un Voyage fait dans l'Intérieur de l'Amérique Méridonale" by Charles de la Condamine, which is dated 1745; "Description des Expériences de la Machine Aérostatique de MM. de Montgolfier," dated 1783, and "Gutta Percha, Its Discovery, History and Manifold Uses," which was published in 1851. The library also contains some personal relics of some of the rubber greats, including those of Thomas Hancock.

Our next stop was at the reclaimed rubber plant of the Northwestern Rubber Company, Ltd., at Litherland, near Liverpool, directly north of Shawbury, where we were cordially received by C. H. Jones, co-director of the firm, and L. Alcock. In business for many years, Northwestern Rubber utilizes the alkali system of reclaiming and has seven digesters, four large and three small. It is currently producing a small volume of synthetic reclaim.

An interesting observation in this reclaiming plant was the utilization of a steam engine which boasts of some 70 years of service. Although still in fair operating condition, this engine will shortly be replaced by a more modern power unit and will be scrapped. Some of the Farrel-Birmingham refiners used in this plant have been in operation for some 40 years and are still

A large portion of the Dunlop plant at Speke is devoted to the manufacture of rubber footwear. Some of the progressional flow is shown here.

giving good service. Four new Berstorff calenders were recently installed. The company enjoys a steady flow of business, with some 20% of its volume earmarked for export. The plant is being operated to its full capacity.

Sports Products at Speke

Heading directly east, we next came to the Dunlop plant at Speke, which is a fairly short run from Liverpool. This plant is operated by the Dunlop Sports Company, Ltd., which is one of the major subsidiaries of the Dunlop Rubber Company, Ltd. Here we talked with S. J. Ball, manager of sport goods, G. H. Ellis, general sales manager of footwear, and G. R. Edwards, technical manager of footwear. Speke is headquarters for Dunlop footwear and sports products, although some tires and tubes are also made as well as some mechanicals, including rubber-resin goods. The tire unit is patterned on Fort Dunlop.

The Speke factory was originally an aircraft plant built on behalf of the British Ministry of Aircraft Production and was taken over by Dunlop in 1945. It covers 101 acres and the various buildings afford 1,400,000 square feet of working area. The main building is 1440 feet long by 600 feet wide with the next largest building measuring 400 feet in length by 200 feet in width. The plant utilizes 150,000 pounds of steam per hour at 200 pounds p.s.i. pressure.

The process water circulating system used in the plant is of special interest. A feature of this system is that the greatest possible cooling capacity is taken from the water by re-circulation through the various processes at least three times. This arrangement allows for the primary water supply at the lowest temperature to be used on the more vital processes where cooling of the stock is an important factor. To achieve this, the total pumping capacity is more than three times that for the initial water supply and is in fact on the order of 620,000 gallons per hour.

Full advantage was taken of the ceiling heights in the main factory building where aircraft was originally produced. These heights vary from 20 to 40 feet and, naturally, the Banburys are installed at the point of the greatest height. Because of the layout of the building, it was possible to design manufacturing operations in straight flow lines starting with compounding at one end of the building and finishing up with inspection of end products at the other end. This layout is believed to be the first example of rubber processing and manufacture in one straight flow line throughout a factory.

Preparation and storage of tire carcass stock at Dunlop's Speke plant is carried out in this portion of the tire department. Note the wide aisles.

Over-all view of the plant of the John Bull Rubber Co., Ltd., at Evington Valley Mills, near Leicester. It has occupied these quarters since shortly before World War I.

As the accompanying photographs indicate, several novel features are found in this factory. These include the use of a conveyor system for bringing raw materials to the mixers which is combined with automatic weighing and dust collection units; a centralized control system where the operations and process conditions are observed and recorded; automatic sheeting and cooling conveyors for the rubber stock, and a pneumatic system for conveying samples of the stock to and from the control laboratory for batch analysis.

A large portion of the manufacturing floor space is allocated to the production of rubber footwear which also follows a progressive flow from delivery of the mixed rubber and processed fabric to the vulcanization chambers where specially designed transporters are provided for loading and unloading the large diameter vulcanizers. All conceivable types of rubber footwear are produced at Speke, including tennis shoes, hockey boots, casuals, canvas shoes, Wellingtons and overboots of all kinds. The practical pocket-fitting footwear made by Dunlop, which are known as Footmacs and are designed to slip over shoes, are also in evidence.

New materials and solings are under constant development by Dunlop. Two relatively new materials now being used commercially are "Resifort", a light and durable soling having much the appearance of leather but with far greater wearing properties, and "Fethertex", a micro-cellular rubber that is light in weight, durable, yet springy and resilient. Dunlop footwear is sold through more than 20,000 retail outlets.

Other major products produced at Speke include heavy conveyor belting and golf and tennis balls. The belting units, which are housed in a separate building, include 20-ton cranes, and there is plenty of headroom for the movement of the belts. The golf and tennis ball departments, which are located in a corner of the main building at the end of the footwear section, feature the very latest equipment and again were organized in straight flow lines similar to the set-up for tire production.

Visit at John Bull Rubber

Turning south from Manchester, after a very pleasant visit with Mr. and Mrs. Francis B. Shaw (Mr. Shaw is one of the owners of Francis Shaw & Company, Ltd., one of the major producers of rubber machinery and equipment in England), we visited G. E. Rowe, chief engineer of the John Bull Rubber Company, Ltd., at

Evington Valley Mills near Leicester. This company was organized in 1906 by John and Hubert Burton as the Leicester Rubber Company. The new company originally confined its activities to the production of cycle tires and a few other rubber products and used "John Bull" as one of several trademarks. The company occupied two or three locations in Leicester in its early period and moved to Evington Valley Mills shortly before World War I. By this time, carriage tiring was one of the major products. It is interesting to note that both of the original founders are still active in the company's management, Mr. John as chairman and Mr. Hubert as managing director.

John Bull Rubber has been producing tires and tubes for many years and is very proud of the fact that it was one of the very first companies in England, if not the first, to offer inner tubes in separate attractive boxes. Prior to that time, inner tubes were shipped in bundles of 20 or 25 and were rarely displayed by the dealers. Another merchandising first the company is proud of was the introduction of the John Bull "sticky patch", which was introduced in 1907 and which is said to have revolutionized puncture repair. The production of tires and tubes and tire repair materials still forms the major portion of the company's products, but it also produces a wide variety of mechanical goods. The expansion of the company in recent years has been so great that the factory at Evington Valley Mills is somewhat on the crowded side at the moment.

Closely allied with the John Bull Rubber Company is Metalastik, Ltd., which was organized in 1937 by M. Goldsmith, who is the present managing director, and some of the directors of John Bull Rubber. Occupying a portion of the John Bull plant, Metalastik produces mountings of all kinds, including those for motor vehicle engines, and holds many patents on design and application. Metalastik units are now produced in France, Italy, Germany and other countries under special arrangement with the parent concern. It should also be recorded that the John Bull organization operates a rubber plant in Nowra, Australia, a few miles south of Sydney.

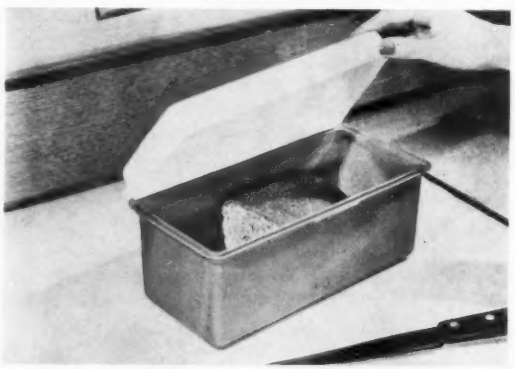
Bath-Tab Baby Bathtub

Contemporary Shop, Williamsburg, Mich., is producing a new type baby bathtub which sets up on any wall near a bathroom or kitchen faucet. High enough for mother to bathe the baby without bending over, the new bathtub is made of Krene plastic which is electronically welded to provide smooth, strong and watertight seams. The tub is installed by simply screwing two metal brackets to the wall and fitting screwheads on the back of the tub frame into keyholes in these brackets. In use, the tub requires no floor space. After use, it is folded flat to hang on a hook in the wall entending out little more than 2 inches. The new tub is more than 27 inches

long, 20 inches wide and eight inches deep, roomy enough for large babies. The tub is filled and empties with a length of hose permanently sealed to the bottom. Supported by two attached arms which are locked to the brackets and braced against the wall, the tub will hold many times the weight of a heavy baby, the company states. The unit's cover folds down over the bathing area to provide a flat surface for drying and powdering the baby. Soft to baby's skin, Krene resists aging, cracking, peeling, mildew and the effects of soaps, most cosmetics, bathroom chemicals and soiled baby garments.

Polyethylene Bread Box

Dapol Plastics, Inc., 90 Grove Street, Worcester 5, Mass., has introduced a durable bread box with a hinged, sealing lid made of flexible Bakelite polyethylene. The cover may be fixed at a 90° angle. Closed, it fits snugly into a groove at the top of the box to form a seal that helps keep bread fresh. Durable and resistant to shock, the box flexes if brought in contact with pots and pans



or kitchen utensils and has a soft surface that will not damage fragile china. This bread box can be easily washed in soap and water. Since Bakelite polyethylene withstands low temperatures, the box may be used as a freezer or refrigerator container. Available with a frosted lid in red, yellow and crystal, the box is 12 inches long, five and one-half inches high, and six and one-eighth inches wide.

Baggage compartments in Lockheed's new Super Constellation are sealed airtight by a new type zippered lining. Thirty-three zipper-sealed panels in two baggage compartments are located in the lower section of the fuselage on each new Super Constellation. The panels are closed by pressure-sealing zippers developed by the B. F. Goodrich Co. Compartment liners are also made by Goodrich of fiberglas combined with a special rubber compound.

Editorials . . .

Synthetic Nomenclature

ALTHOUGH the term "synthetic rubber" is generally applied both by the industry and the layman to the wide variety of copolymers which are now part and parcel of the rubber industry there are many who still feel that such a term is not quite proper. Every now and then some organized effort is made to change the nomenclature and to fix upon some one single term or phrase which will more adequately reflect the special characteristics of these still relatively new materials which continue to expand in number and purpose. The entrance of new and different polymers in the field still further complicates the problem.

Many of our readers will recall the effort made in 1942 by the Office of the Rubber Director, then part of the War Production Board, to select a short, phonetic name which would convey to the industry and to the public the fact that special types of rubber were being produced which were different from the natural varieties and yet were not inferior or substitute products. As a matter of fact, both of the domestic rubber journals carried invitations to rubber chemists and technologists to offer suggestions for such a name, and hundreds of suggestions were received. These were turned over to John Ball and H. E. Simmons, then affiliated with the Rubber Director's Office, and these two worthies spent many an evening sorting and discussing the suggestions. Because of the numerous difficulties involved, the end result was a decision to stick with previously applied government designations, namely, GR-S, GR-I, GR-A, etc.

In the intervening period, various individuals and companies have attempted to use phraseology which in their opinion was more descriptive of the materials in question. For example, E. G. Holt, a government employee long closely associated with the over-all rubber picture, prefers the term "chemical rubber" and utilizes this term when and wherever he can. The B. F. Goodrich Company tends toward the term "American Rubber" and uses it in connection with company literature, advertisements, press releases, and the like. The Goodyear people frequently refer to "man-made rubber" but the company on the whole does not seem to have any special preference. And so it goes.

The latest entrant into this somewhat confused picture is the Polymer Corporation, Limited, of Sarnia, Canada, producers of various types of polymers, including the Polysar rubbers. Polymer has recently requested its customers to say "manufactured rubber" when thinking of the Polysar products. This decision was arrived at following some checking with the dictionary. In the dictionary consulted, the word "synthetic" was defined as "not genuine, artificial, factitious," while "manufactured" was "made by machinery or other agency . . . to work as raw materials into suitable forms for use." Since the company feels that the latter definition is more indicative of the polymers, it has asked its employees and friends to use "manufactured rubber" when speaking of such polymers.

Polymer Corporation does not completely decry the term "synthetic rubber." It points out that during wartime, when research work was rushed and manufacturing processes were not as efficient as they are today and rubber was used for war purposes, the word "synthetic" became one which was subject to some abuse because the properties of the newly-produced copolymers were misused and misunderstood. Today these polymers are universally accepted as dependable "substances" for tires, tubes, flooring, soling, cable, paints, etc. This acceptance of a product formerly shunned by some of the buying public, according to Polymer, is due to the research work which has made possible its proper use for various purposes. Since the time has come when the Polysar products do the work for which they are intended, and do it well, the company feels that the time has also come to make a change in the nomenclature from "synthetic rubber" to "manufactured rubber."

Frankly, we feel that any attempt to change the nomenclature of the synthetic rubbers at this late date where the buying public is concerned is bucking up against a stone wall. In the same sense that all transparent papers are "cellophane" and any rigid plastic product is "bakelite," to the layman any rubbery material other than natural rubber is "synthetic rubber." And in nine cases out of ten, the layman cannot distinguish between the natural and the synthetic product. In the final analysis, where the public is concerned, what difference does it make as long as the product furnishes promised performance! As for the rubber industry itself, call it "chemical," call it "man-made," call it "American," or call it "manufactured," the average rubber chemist will continue to think of it as just plain, ordinary synthetic rubber. Proof? Take a look at the literature.

Highlights Sidelights *of the News . . .*

November, 1954

GR-S sales in January, 1955, will drop 7% from December, 1954, figures, according to estimates made by the Federal Facilities Corporation . . . It is expected that 46,500 long tons of GR-S will be sold in the last month of this year compared with 43,000 long tons in the first month of '55 (page 265).

Three or possibly four bidders for the synthetic rubber plants being offered by the government have just about met all requirements set forth by the Rubber Producing Facilities Disposal Commission . . . Other bidders, however, are said to be a long way from successful completion of sales . . . It has been reported that the Disposal Commission will soon take to task "bargain hunters" among plant bidders (page 265).

Goodrich has announced an expansion program which will involve an outlay of $100,000,000 over the next five years . . . A large share of this expansion will be devoted to tubeless tire production and distribution facilities . . . The company is also planning a $3,500,000 expansion program at its recently acquired Sponge Products Division to more than double foam rubber production capacity (page 268).

GSA and its Industry Advisory Group have begun meetings to determine the advisability of continuing stockpiling of certain grades of natural rubber . . . World production of natural in the first eight months of 1954 was approximately 13,000 tons above production in the first eight months of '53 (page 268).

Rubber Groups about the country have been privileged to hear some particularly fine papers during the past few weeks . . . A paper on "Isocyanates and Their Reaction Products" was heard by Detroit (page 273) . . . New York heard a paper by M. E. Lerner, editor of RUBBER AGE, on "Some Observations on the European Rubber Industry" (page 275) . . . and Tracerlab, Inc., concluded a successful 3-day symposium on "Applications of Radioactivity in the Rubber and Plastics Industries" (page 276).

Some interesting data on the types and percentages of various insulating materials used in the production of insulated wire and cable have been released by the Agriculture Department . . . It is seen, for example, that about 20% of the insulating material used in the production of automotive and aircraft wire and cable is rubber, and that three-fourths of this is synthetic and one-fourth, natural (page 266).

NEWS REPORTS and Industry Activities

FFC EXPECTS 7% GR-S SALES DROP IN JANUARY; THREE PLANT BIDDERS REPORTEDLY MEET TERMS

LAURENCE B. Robbins, Administrator of the Federal Facilities Corp., announced on October 20 that sales of GR-S by the corporation for the month of January will be approximately 43,000 long tons. This reduction of approximately 7% from December, 1954, sales, is attributed to consumer inventory adjustments. FFC stood by earlier estimates that December sales will run to 46,500 long tons and November sales to 43,000 long tons.

According to trade sources, at least three companies have met the government's terms for sale of the synthetic rubber plants. This report marked the first hopeful sign of progress in negotiations launched last June by the government and the firms bidding for the opportunity to buy the government-owned plants. Each of the bidders is after one or more of the war-built facilities. In all, twenty-seven plants are up for sale, representing a government investment of over $500,000,000.

FFC, which manages the government-owned synthetic rubber plants, in its announcement on October 20, said it plans to produce 40,400 long tons of GR-S in November, 44,300 long tons in December and 44,000 long tons in January.

The following table sets forth FFC's estimate of production and sales of GR-S for the three-months' period ending January, 1955. These figures include the oil content of oil-extended rubbers, but exclude the carbon black used in carbon black masterbatches:

Month	Production	Sales
November	40,400	43,000
December	44,300	46,500
January	44,000	43,000

FFC also announced that its GR-S inventory totaled 70,400 long tons as of September 30, 1954. This was a drop of some 12,000 long tons from August 31, the first major cut-back in some time. Government stocks hit a peak of 89,000 long tons in May of this year and then dropped off steadily throughout the summer.

Reducing Inventories

It is reported that the inventory is being trimmed in anticipation of transferring the synthetic rubber plants to private industry some six months hence.

September sales amounted to 51,260 long tons, including some 6,500 long tons carried over from orders placed for July and August delivery, but deferred because of strikes which hit the industry at that time.

FFC reports that total production of GR-S for the calendar year 1954, including the oil content, will be approximately 470,000 long tons. Total sales will be approximately 488,000 long tons.

Trade sources which reported that three bidders for the synthetic rubber plants were nearing success also reported that some other bidders are getting close to the prices sought by the Rubber Producing Facilities Disposal Commission. In still other cases, a considerable gap is said to remain between asking and offering prices.

The Commission is reported to have deferred signing sales contracts with the three firms pending the completion of negotiations with other firms. Congress has set a December 27 deadline for contract signings.

Problems Facing Commission

Although the plants sought by the three "successful" bidders were said to be among the largest in the disposal package, the Commission still has a long way to go toward meeting its goal of selling enough plants to produce 547,000 tons of rubber annually. Congress has said that it will veto any program failing to match the minimum tonnage or providing "full, fair value" for the facilities.

As to the actual bidding on the plants, it has been reported in some quarters that only 5 of the 27 plants attracted more than one bid, and bids were not entered at all on three of them. The 57,000 ton styrene monomer plant at Los Angeles reportedly received 11 bids, and bids on the 89,000 ton GR-S plant there were entered by at least 4 companies. Multiple bids are said to have been received on 3 of the 8 butadiene units—those at Lake Charles, Port Neches and Houston. Only one bid each was entered on 19 plants, these reports state.

It has also been intimated that the Disposal Commission is about to "take to task" certain bidders for the plants. The Commission is said to be confident of selling the minimum tonnage requirements at a fair price and from this position will start dealing sharply with low bidders in search of a bargain.

Some inkling of current activities by the Commission may be dropped when chairman Holman D. Pettibone speaks at the annual luncheon of rubber manufacturers in New York City on November 18. Upwards of 200 rubber manufacturers, together with executives of the petroleum and chemical companies which have been interested in the disposal program, are expected to attend the meeting.

Mr. Pettibone will be accompanied by Commissioners Leslie R. Rounds and Everett R. Cook. Also attending will be executive director Eugene Holland and Donald D. Holgate, consultant to the Commission. The luncheon has been scheduled in conjunction with the 39th Annual Meeting of the Rubber Manufacturers Association.

Other Processing Oils

In the more mundane matter of plant operations, FFC has announced that sometime ago it made available for consumer evaluation X-755 and X-756 which were aromatic type oil masterbatches containing Socony Vacuum XT-784-X and Sinclair Extract P-128, respectively. The results of consumer evaluation indicate that both these aromatic processing oils are interchangeable with other aromatic types currently used in the production of oil masterbatches—namely, Shell SPX 97 and Sundex 53.

Accordingly, inasmuch as Socony Vacuum XT-784-X and Sinclair Extract P-128 meet the specifications of the Office of Synthetic Rubber, FFC is including these two oils in its line on an interchangeable basis. In accordance with FFC's standard practice of identifying the processing oil used, Socony Vacuum XT-784-X will be identified with the code letter "Y", while Sinclair Extract P-128 will be identified with the code letter "E".

AGRICULTURE DEPARTMENT RELEASES DATA ON ELECTRIC WIRE AND CABLE

During the late summer and fall of 1953, the United States Department of Agriculture undertook a survey of the manufacturers of insulated wire and cable to learn the patterns of use and preference for different fibers used as insulating materials. A full report, including detailed information concerning the major materials used for insulating purposes, will be issued at a future date, the department states. However, because of immediate interest in the volume figures, part of the information has been made available.

The items covered in the study were as follows: Communication wire and cable, magnet wire, weatherproof and slow burning wire and cable, building wire and cable, power wire and cable, appliance wire and cord, and automotive and aircraft wire and cable. All other types of electric wire and cable, such as parkway cables, mineshaft cables, and instrument lead wire were grouped under the heading of "other".

For all types of insulated wire and cable included in the survey, plastics accounted for more than one-third and rubber for one-fourth of the consumption of all fibers and materials reported. Paper and cotton came next, with 16 and 11%, respectively.

Of all the fibers and materials reported for insulation, the greatest quantity went into communication wire and cable, with building wire and cable and power wire and cable next in volume. Appliance wire and cord, weatherproof and slow-burning wire and cable, automotive and aircraft wire and cable, and magnet wire followed in that order. All other types of insulated wire and cable accounted for less than 1% of the total pounds of insulating material used by this industry.

Type of Insulated Wire and Cable	*% of Insulating Material Used*
Communication	36
Building	25
Power	21
Appliance	10
Weatherproof & Slow-burning	4
Automotive & Aircraft	2
Magnet	1
Other	1
Total	100

Communication wire and cable: In this type, plastics were used in greatest volume, accounting for almost one-half of the total insulation material used. Paper ranked next, with less than one-fourth, and rubber followed with less than one-fifth. Of the 72,000,000 pounds of plastic material used by this division of the industry, two types —polyethylene and vinyl resin—were used in about equal quantities and together accounted for 94%. Of the 35,500,000 pounds of paper used, almost 60% was in paper pulp, and 40% in untreated paper. Of the 28,000,000 pounds of rubber used, almost 90% was synthetic, the rest being natural rubber.

Magnet wire: Cotton, all of it in the form of yarn, was the material most used for the insulation of magnet wire, accounting for somewhat less than half of the total. Fibrous glass and paper were next in importance. The fibrous glass used for this purpose was in the form of filaments, chopped strands, roving and yarn. Almost two-thirds of the paper was in treated form and the rest untreated.

Weatherproof and slow-burning wire and cable: In this category, cotton was again the leading fiber, followed by plastics and paper. The cotton used was almost all in the form of yarn. Of the 3,750,000 pounds of plastics used, almost three-fourths was polyethylene; the remainder was vinyl resin. All the paper used was untreated.

Building wire and cable: In this group, the three most important insulating materials were plastics, rubber, and paper, in that order. Plastics accounted for a little more than two-fifths, rubber for more than one-fifth, and paper less than a fifth of all the materials used. The plastic was almost entirely vinyl resin, and the rubber was almost all synthetic. Slightly more than half of the paper was treated.

Power wire and cable: Materials used for power wire and cable were somewhat more evenly distributed among the various fibers. Rubber accounted for a little over a third of the total, plastics one-fifth, and paper and cotton over a tenth each. Almost 90% of the rubber used was synthetic; vinyl resin was the most important plastic.

Appliance wire and cord: Almost half the insulating material used in this group was rubber; almost a third was plastic. More than 85% of the rubber was synthetic, and vinyl resin was by far the most important plastic.

Automotive and aircraft wire and cable: Plastics accounted for over half the insulating materials used by the manufacturers of automotive and aircraft wire and cable. Cotton and rubber, which were used in about equal volume, accounted for more than 40% of the total. Here too, vinyl resin was the plastic most used. Almost two-thirds of the cotton consumed by this branch of the industry was in the form of yarn and more than one-fifth was cotton braid. Of the rubber used, three-fourths was synthetic and one-fourth natural.

Of the 3,000,000 pounds of material used as insulation for other types of electric wire and cable, plastics and cotton were the most important. Although all of the major types of plastics were used, the report states, vinyl resin accounted for almost three-fourths of the total. Only two types of cotton were used—rubber-filled cotton tape and cotton yarn. The tape constituted about two-thirds of the total weight of cotton consumed in these end products.

Goodall and Whitehead to Merge

Stockholders of the Goodall Rubber Co. and the Whitehead Brothers Rubber Co., both of Trenton, N. J., have authorized the merger of the two companies as of December 31. The surviving corporation will be the Goodall Rubber Co.

Elections at United Clay Mines

At a special meeting of the board of directors of the United Clay Mines Corp., held at Trenton, N. J., on October 14th, Bernard F. Gentsch was elected president to succeed the late Ogden A. Kantner. Following his graduation as a ceramic engineer from Alfred University in 1940, Mr. Gentsch joined the technical staff of the company. He served with the armed forces from 1941 through 1945 and was later associated with the Baldwin-Lima-Hamilton Corp. of Philadelphia. In 1947, he returned to United Clay Mines Corp., as sales manager and became vice-president in March of 1952. Gordon W. Lee, vice-president of the company, was appointed vice-president and general manager. Mr. Lee graduated from the University of North Dakota in 1939 as a mining engineer and came to the company in 1947 after spending a number of years with the Braden Copper Co., in Santiago, Chile. He is also a director of Carolina Resources Corp. The board also made Girard W. Phelps vice-president and technical director. Mr. Phelps graduated from the University of Alabama and took his master's degree in ceramics at Rutgers University. He has been with the company since 1939. Ralph E. Rhodes, Jr., a graduate ceramic engineer, Alfred University, class of 1942, and widely known throughout the ceramic industry, was appointed sales manager. Other officers of the company are Ogden H. Dilts, treasurer, and Kenneth E. Ward, secretary. Mr. Dilts and W. Enos Wetzel were also named as members of the board of directors.

Goodyear Raises Tire Prices

An increase of 5% in the consumer list price of tires was announced on October 31 by the Goodyear Tire & Rubber Co. The increase was effective as of November 1 and applies to all passenger car tires, small truck tires and farm tractor tires. The prices of larger truck tires are being adjusted within the 5% range on a basis of their size. The company stated that the price increases were made necessary by the recent advance of 30% in the price of natural rubber, and by wage increases granted Goodyear employees in mid-summer. Previously, the General Tire & Rubber Co. had announced a 5 to 8% rise in the price of some of its tubeless passenger car tires. In announcing General Tire's price rise, vice-president L. A. McQueen said: "It is likely that all truck tires and most other passenger car tires prices will be raised shortly." This was confirmed on November 2, when U. S. Rubber and Firestone announced price rises in accord with those established by Goodyear.

Brazilian Tire Production

According to the Brazilian National Rubber Commission, tire production in that country is expected to reach 2,000,000 units this year. During the first five months of 1954, truck and bus tire output amounted to 343,425 units, while tire production for automobiles and other vehicles totaled 410,177 units.

SIGNAL CORPS LABORATORIES PLAN 3rd ANNUAL SYMPOSIUM

The Wire Communication Branch of the Coles Signal Laboratory, Signal Corps Engineering Laboratories, Fort Monmouth, N. J., has announced that the Third Annual Symposium on "Technical Progress in Communication Wires and Cables" will be held on December 7, 8, and 9 at the Berkeley-Carteret Hotel in Asbury Park, N. J. The symposium will be jointly sponsored by the industry and the laboratories.

A full program of papers and other activities has been planned. Registration will begin at 4:00 P.M. on December 6. Communications to the laboratories relative to the symposium should be addressed to Director, Coles Signal Laboratory, Fort Monmouth, N. J., Attention: Mr. H. L. Kitts.

Brigadier General F. F. Uhrhane, Commanding General of the Signal Corps Engineering Laboratories, will deliver the welcoming address on December 7. The morning session on that date will be presided over by M. Tenzer, Chief, Microwave Unit, Components and Materials Branch. Papers scheduled for this session include:

"The Evaluation of Fungus Resistance of Radio Frequency Cable Jackets" by A. Rogel, Components and Materials Branch, Squier Signal Laboratory, Fort Monmouth, N. J.

"Natural and Artificial Aging of Wire Jackets" by C. W. Hamilton, R. I. Leininger, and G. M. L. Sommerman, Battelle Memorial Institute.

"Submarine Cable System for the Florida Missile Test Range" by F. Calhoun, Air Force Missile Test Center, Patrick Air Force Base, Florida.

"Trans-Atlantic Cable" by M. C. Biskeborn, Bell Telephone Laboratories.

"A Report on Some Work Now Being Done to Improve Electrical Connectors" by C. Quackenbush, Whitney Blake Co.

W. R. Krueger, Chief, Line Equipment Unit, will preside over the afternoon technical session on December 7. Papers scheduled for presentation at this session include:

"Mechanical Splice Closures" by P. P. Koliss, Bell Telephone Laboratories.

"Hot Gas Welded Splice Closures for Plastic Cables" by A. D. Varenelli and E. R. Kerwin, Ansonia Wire & Cable Co.

"Self-Supporting Telephone Cable Using Copperweld Conductors" by V. McBride, Plastic Wire & Cable Corp., J. Ruhlman, Preformed Line Products Co., and F. E. Leib, Copperweld Steel Co.

"Balanced Radio Frequency Cables" by C. C. Camillo, G. F. Kovar, and R. M. Soria, American Phenolic Corp.

"Measurements of Low Temperature Fexibility of Electric Cable" by W. Couch and C. Alm, Whitney Blake Co.

The technical session on the morning of December 8 will be precided over by H.F. X. Kingsley, Chief, Wire and Cable Unit. Papers scheduled for presentation at this session include:

"Engineering Polyethylene for Wires and Cables" by E. J. Burroughs and Dr. E. E. Lewis, E. I. du Pont de Nemours & Co., Inc.

"Electron Irradiated Polyethylene" by P. A. Goodwin, General Electric Co.

"The Aging of Polyethylene Compositions" by W. D. MacLeod, Imperial Chemical Industries, Ltd., Hertfordshire, England.

"Quality Control of Vinyl and Polyethylene Electrical Insulating and Jacketing Materials" by R. C. Boyd, Bakelite Co.

"Kel-F Elastomer—A New Material for the Electrical Industry" by M. E. Conroy and L. E. Robb, M. W. Kellogg Co.

"Manufacture of Aluminum Conductor Cable" by J. S. Herbert, Western Electric Co.

H. G. Gold, Chief, Cord and Cordage Unit, will preside at the technical session in the afternoon on December 8. The following papers will be presented at this session.

"An Evaluation of Vinyl Hook-Up Wires" by A. H. Lybeck and S. J. Trykowski, William Brand & Co., Inc.

"The Application of Silicone Insulated Wires and Cables" by L. B. Short, General Electric Co.

"Cold GR-S Polymers for Wire Insulation" by Dr. L. H. Howland, Dr. R. W. Brown, and C. W. Lawson, Naugatuck Chemical Division, U. S. Rubber Co.

"Butyl Polymer Compounding for Wire and Cable" by E. W. Schwartz, Southern Clays, Inc.

"Butyl Insulation" by W. C. Smith, Standard Oil Development Co.

"The Effects of Conductor Temperature on the Quality of Extruded Vinyl Insulation" by M. M. Suba and E. E. Griesser, Bakelite Co.

A banquet will be held in the evening of December 8, with Major General G. I. Back, Chief Signal Officer, as guest speaker.

Technical sessions will continue on the morning of December 9. This session will be presided over by H. L. Kitts, Chief of the Outside Plant Equipment Section. Papers scheduled for presentation at this session include the following:

"Specification Changes and New Developments in Wire and Cable for REA" by C. R. Ballard and A. L. Ritchie, Rural Electrification Administration, U. S. Department of Agriculture.

"A Resin-Sealed Approach to Communication Splicing" by E. W. Bollmeier, Minnesota Mining & Manufacturing Co.

"The Role of Wire and Cable in Military Communications" by H. L. Kitts and H.F.X. Kingsley, Wire Communication Branch, Coles Signal Laboratory.

In addition to the papers, a film will be shown at the morning session. Commentary for the film, entitled "Cable—Pathway of Power", will be supplied by R. C. Graham of the Rome Cable Corp.

STANDARD PRODUCTS ANNOUNCES APPOINTMENT OF TWO VICE-PRESIDENTS

Robert Grant

W. H. Thourlby

Standard Products Co., Cleveland, Ohio, has announced the promotion of Robert Grant to vice-president in charge of manufacturing and W. H. Thourlby to vice-president in charge of sales. At the same time, James M. Hannan was promoted to sales manager. Mr. Grant was formerly general operations manager, and is in charge of all manufacturing operations at the company's six plants. Before joining Standard Products a year ago, he was associated for seventeen years with Nash Motors and as a vice-president of Modine Manufacturing and other firms. Mr. Thourlby has been director of customer relations, and has served in the Detroit sales office of Standard Products since 1945. Before then, he served for six years as its Washington representative and as a production executive in the Port Clinton and Cleveland divisions. Mr. Hannan has been with the company for seven years, serving in the Detroit sales office as assistant sales manager. He was a commander in the Navy during World War II, and before then was associated with Macy's department store in New York City.

Wyandotte Chemicals Corp., Wyandotte, Mich., has announced a newly-published 72-page booklet entitled "Glycols and Related Products". Copies are available on request to the company.

GOODRICH ANNOUNCES PROGRAM FOR EXPANSION OF FACILITIES

At a special press conference held on October 26 at the Waldorf-Astoria Hotel in New York City, Joseph A. Hoban, vice-president of the Tire and Equipment Division of the B. F. Goodrich Co., announced a five-year program designed to increase greatly the company's annual sales and involving an expected outlay of $100,000,000 for new and improved facilities. A large share of this expansion will be devoted to tubeless tire production and distribution facilities, Mr. Hoban stated.

The company, which first introduced tubeless tires in 1948, has manufactured and sold about 3,500,000, more than the combined total of all other makes, the Goodrich executive declared. "Even though we have that lead," he said, "we plan to continue improving our position in the tubeless tire field."

In the past year the company has set up an organizational structure with the object of increasing its annual net sales in all divisions. Capital expenditures for expansion in 1954—largely needed for tubeless tires—will exceed $30,000,000. Mr. Hoban stated that the company expects to spend more than $100,000,000 over the next five years.

Mr. Hoban, in introducing the company's new original equipment passenger car tubeless tire, the "Safetyliner", said the tubeless tire's light weight and inherent protection against blowouts have been responsible for its acceptance by automobile manufacturers as original equipment on 1955 cars.

He also unveiled a heavy duty tubeless tire for trucks, a tubeless tire for farm tractors, a nylon tubeless tire for jet fighter planes and for heavy bombers, and a wide-based tubeless tire for heavy earthmoving and construction equipment.

Calls Inner Tube Obsolete

Mr. Hoban observed that right now, "the inner tube is as obsolete as the hand crank and as out-of-date as the running board. It will take three years to replace the inner tubes on the majority of America's automobiles. In five years—by 1960—the inner tube will be dead."

In 1960, he said, there will be 55,000,000 passenger cars registered in the nation, compared with 48,000,000 today. "The passenger car tire replacement market—by this time it will be almost exclusively tubeless tires—will be 66,000,000 units, compared with 48,000,000 today," he said.

Other news on Goodrich expansion plans has come from F. M. Daley, president of the B. F. Goodrich Sponge Products Division. Mr. Daley has revealed a $3,500,000 expansion program which will more than double the company's foam rubber production capacity. Mr. Daley told employees at the company's Shelton, Conn., plant that the expansion is "further evidence of B. F. Goodrich's faith in the future of New England.

"Greatly increased customer demand, reflecting the trend to foam rubber by the furniture and bedding industries, is responsible for the company's decision to expand its facilities in Shelton. A total of 460,000 square feet of floor space will be added", Mr. Daley stated.

On August 13 of this year, Goodrich acquired ownership of the assets and business of the Sponge Rubber Products Co., to form the Sponge Products Division. The division also has plants in Derby, Conn., Fall River, Mass., and a Canadian subsidiary at Waterville, Que.

Vehicle Registration Rises

Motor vehicle registrations in 1953 totalled 56,279,864, nearly 6% more than in 1952, according to figures released by the Bureau of Public Roads, U. S. Department of Commerce. Of the total registrations, 46,460,094 were passenger cars, 9,575,519 were trucks and 244,251 were buses. Passenger car registrations increased 6%, trucks were up 4% and buses 1.6% during 1953. The Bureau estimated motor vehicle travel on roads and streets in 1953 at 540,000,000,000 vehicle-miles, an increase of 5½% over 1952.

To Build Isocyanates Plant

Mobay Chemical Co., St. Louis, Mo., will build a full-scale production plant near New Martinsville, W. Va., for the manufacture of isocyanate chemicals. Mobay is jointly owned by Monsanto Chemical Co. of St. Louis and Farbenfabriken Bayer A.-G. of Germany. Monsanto has been producing isocyanates in a small-scale interim plant at Anniston, Ala., and Bayer has been in commercial production of the chemicals for more than two years. The new plant will be capable of producing several hundred tons of isocyanate chemicals a month and equivalent amounts of polyester resins. Until it is in operation, Mobay will supply the chemicals from its Anniston plant. No finished products will be manufactured in the new plant. Mobay will supply the resins, activators, modifiers, catalysts and other chemicals, as well as the technical know-how and machinery for producing foam to its customers, who in turn will manufacture finished products under license agreements with Mobay.

Collettes Take Over Oak Rubber

Holdings of the J. W. Shira family in the Oak Rubber Co., Ravenna, Ohio, have been purchased by the family of the late Paul E. Collette, co-founder of the firm. The announcement was made recently by W. R. "Bob" Collette, former Ravenna Council president, who succeeded his father as an officer and director in the firm after the latter's death in 1950. The company, said to be the world's largest manufacturer of toy balloons, was founded in 1916 by the elder Mr. Collette and John W. Shira Sr., both of whom played an active part in building the firm to a position as a leader in balloon design and manufacture.

GOVERNMENT STUDIES ADVISABILITY OF STOCKPILING CERTAIN GRADES

According to an announcement on October 27, the advisability of continuing stockpiling by the federal government of certain grades of crude natural rubber will be studied by the General Services Administration and representatives of the rubber industry. GSA announced that it had met with its Industry Advisory Group on October 26 because the worth of certain grades of re-milled rubber has been declining in recent years.

The Advisory Group appointed a special technical committee to ascertain whether or not the continued stockpiling of such grades is advisable. The group is composed of representatives from leading rubber companies in the United States. GSA said that while no deadline has been set for the special study, work would proceed as rapidly as possible.

Meanwhile, the U. S. Department of Commerce announced that world production of natural rubber totaled 1,135,000 tons for the first eight months of 1954, up slightly from 1,122,500 in the same period of the preceding year.

World consumption, according to figures supplied by the International Rubber Study Group, was 1,102,500 for the first eight months of this year, contrasted with 1,060,000 tons in the first eight months of 1953.

World stocks of natural rubber at the end of August were estimated at 832,000 tons, with 257,000 tons in producing countries, 410,000 tons in consuming countries and 165,000 tons afloat. Secret government stockpile figures were not revealed.

World Synthetic Production

World synthetic rubber production for the first eight months of this year was estimated at 460,000 tons, and consumption at 462,500 tons. The preceding year, these figures were 669,919 tons and 620,000 tons, respectively, not including Russian synthetic rubber.

Total world consumption, both natural and synthetic, was estimated at 1,565,000 for the eight-month period of 1954, compared with 1,680,000 in January to August, 1953.

Nylon-Plus Life-Saver Tire

Newest addition to the passenger tire line produced by the B. F. Goodrich Co., Akron, Ohio, is the "Nylon-Plus Life-Saver" tubeless tire built with nylon cord construction. The new tire is twice as strong as an ordinary tire and protects against heat, flexing fatigue, bruises and moisture, Goodrich states. The Nylon-Plus also seals punctures permanently, protects against blow-outs and offers maximum skid resistance with a tread design made up of thousands of tiny blocks of rubber. Nylon cord used in the new tire is the same as that which proved itself in millions of miles of use in Goodrich truck tires. The Nylon-Plus can be recapped many times. It is available in all popular passenger car tire sizes in whitewall construction.

SEES INCREASING NYLON USE IN PRODUCTION OF TIRE CORD

Better tires for both passenger cars and trucks, as a result of the vigorous competition between rayon and nylon in the tire cord field, were forecast recently by a representative of the Textile Fibers Department of E. I. du Pont de Nemours & Co., Inc. In a speech before the 34th Annual Convention of the National Association of Independent Tire Dealers in Chicago, Ill., W. D. R. Straughn, manager of the Rubber Industry Sales Section of the Textile Fiber Department, prophesied increasing penetration of the tire cord market by high-performance nylon would spark accelerated research on high-tenacity rayon cord, with automobile and truck owners reaping the benefits.

Mr. Straughn pointed out that DuPont sells nylon and "Super Cordura" high-tenacity rayon to the rubber industry. "We are competing with ourselves", he said, "but we feel it is important to develop and produce better products even though they compete with some of our other products."

Rayon entered the tire cord picture in 1936, he recalled, when DuPont started production of "Cordura" rayon tire yarn for the rubber industry. World War II greatly accelerated adoption of the high-tenacity fiber as it helped to keep the American Army on wheels from the South Pacific to the Siegfried Line.

"After the tests on rayon cord tires, made by the rubber companies in cooperation with the government, the high-tenacity industry expanded rapidly," Mr. Straughn reported. "DuPont, the pioneer, contributed its manufacturing know-how to competitors, just as the tire companies exposed their techniques to each other to help win the war."

Rayon's general adoption in tire manufacturing by 1943 was attributed by Mr. Straughn to these characteristics: strength, resistance to heat, control of properties in manufacture, uniformity in quality, and stability of price. In "Super Cordura" high tenacity rayon, introduced by DuPont for tire cord in 1953 as the result of the first major change in the chemistry of the rayon process, these qualities are enhanced, he stated.

War Accelerates Demand

World War II resulted in another great forward step in tire cord, Mr. Straughn said, when the operation of super-bombers and high speed pursuit planes on make-shift runways demanded tires with entirely new standards of impact resistance. The great resilience and impact resistance of nylon soon made it the standard fiber used in this demanding field.

With the release of nylon for civilian use after V-J Day, DuPont technicians and rubber industry experts began intensive research to make its war-proved advantages available to the American public. Recently perfected hot-stretching techniques have brought impressive expansion in the use of nylon by the tire manufacturers.

Paralleling its dominance in "off-the-road" tires, nylon is now used in 12 brands of truck tires, a three-fold increase in the past year, Mr. Straughn reported. "The growth of nylon passenger tires has been even more spectacular," he added. "During the summer of 1953, there were three brands available to the public. One year later, there were 27 different brands being advertised and sold. Today, there are 32 brands."

In summarizing the reasons for nylon's strong move in the race for tire cord supremacy, Mr. Straughn cited these qualities: "Nylon is strong. Its strength greatly exceeds that of the best rayons. Pound for pound, it is stronger than steel. Its strength can be used to make lighter tires which run cooler.

"Nylon has outstanding bruise and impact resistance. We can say it is nearly perfect in this property. Impact failure of a tire reinforced with DuPont nylon is essentially unknown. Nylon has heat resistance far beyond the temperatures normally encountered in a tire. Actually, the rubber itself would probably break down first. Nylon retains high strength even in the presence of moisture.

"These factors make nylon a superior cord for reinforcing tires," Mr. Straughn declared. "Nylon truck tires give outstanding performance under heavy loads and at high speeds. The same is true of nylon passenger tires. They will stand the speed and the bumps. It is indeed the safest tire ever built."

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GOODYEAR CHEMICAL ADDS TWO SPECIAL REPRESENTATIVES TO SALES STAFF

Paul A. Koons

Joseph M. Donohue

The Chemical Division of the Goodyear Tire & Rubber Co., Akron, Ohio, has added two more special representatives to its sales organization. Paul A. Koons has been assigned to the Cleveland territory and Joseph M. Donohue to the Boston district office. The two men will specialize in sales of the company's Chemigum nitrile oil-resistant rubbers. Mr. Koons has considerable experience in sales service work and in supervisory production in chemical processing. He received his bachelor of science degree in chemical engineering from Case Institute of Technology. He is a member of Alpha Chi Sigma, the American Chemical Society and the American Institute of Chemical Engineers. Mr. Donohue also has considerable experience in the chemical and rubber fields in production and technical supervisory capacities. He was graduated from Massachusetts Institute of Technology with a bachelor of science degree in business and engineering administration. He is a member of the American Chemical Society and the A.I.C.E.

Koger Appointed Plant Manager

Glen Koger has been appointed manager of the Torrance, Calif., plant of the Rome Cable Corp., while Gilbert Woodill, who has been acting manager of the plant for several months, has been elected assistant treasurer of the company. Mr. Koger was graduated from Kansas State College in 1929 with a degree in electrical engineering. He served with the General Electric Co. for 19 years, 17 of which were spent in the Insulated Wire Department at Bridgeport, Conn. Mr. Koger was designing engineer at Bridgeport for eight years and head of the Engineering Department for five years. In 1948, Mr. Koger joined Walker Brothers, manufacturers of electrical construction materials in Conshohocken, Penna., as a director and vice-president in charge of copper products. He served in that capacity until March, 1954, when he joined Rome Cable.

Pirelli Building New Plant

Pirelli, S.p.A., is building a new plant for the manufacture of rubber, paper and plastic insulated cables at Arco Felice, Pozzuoli, Italy. The new plant will have a special department for the production of submarine cables and docking facilities for loading these cables directly aboard cable-layers. It is expected that the new plant will be in operation in the spring of 1955.

ASTM REVIEWS RECENT STANDARDIZATION ACTIVITIES OF COMMITTEE D-11

The American Society for Testing Materials, in a review of standardization activities of its technical committees, as published in the September, 1954, issue of the *ASTM Bulletin*, reports that Committee D-11 on Rubber and Rubberlike Materials is organizing a new Subcommittee on Synthetic Rubber. This subcommittee will undertake a technical program on specifications and test methods for government synthetic rubbers when the U. S. synthetic rubber plants are turned over to private industry. A new subcommittee is also being formed to sponsor technical programs and symposiums.

It is also reported that the comprehensive "Glossary of Terms Relating to Rubber and Rubberlike Materials" is now being reviewed looking toward its publication by the Society.

A new Tentative Recommended Practice for Standard Test Temperatures for Rubber Products has been completed for committee letter ballot. It covers testing temperatures to be employed for the testing of rubber products in those instances where methods contain reference to the recommended practice.

The numerous individual specifications for rubber-insulated wire and cable have been extensively reviewed and will be revised and brought up to date later this year. General specifications, which cover the constructional details, materials, and voltage test requirements for rubber-insulated wires and cables used for the distribution of electrical energy have been prepared.

The individual specifications will make reference to the applicable portions of these general specifications. In addition, the extensive Methods of Testing Rubber and Thermoplastic Insulated Wire and Cable (D 740) have been completely revised to include the various tests that are required by the individual specifications.

Ozone-Resistant Butyl

There have also been prepared new specifications for ozone-resistant Butyl rubber, and for polyethylene insulated wire and cable. It is expected that committee letter ballots on these specifications and test methods will be completed during the summer so they can be submitted to the Society for publication through the Administrative Committee on Standards.

The Subcommittee on Packings completed this year Tentative Purchase Specifications for Sheet Rubber Packing (D 1330) which cover packing or gaskets cut from sheets intended for general gasket application on water, air, and low-pressure steam lines. For use in connection with these specifications and also for the general SAE-ASTM Specifications for Gaskets (D 1170), the committee has undertaken an investigative program to develop a test method for relaxation of commercial gasketing.

The Subcommittee on Rubber Latices is continuing its cooperative laboratory study of a method for determining volatile fatty acids in latex as a measure of chemical stability. Results of the first round-robin indicate that this method may offer a reproducible test for measuring at least one phase of chemical stability. A procedure for sampling lots of latex in drums has been prepared and is being considered in connection with the International Committee ISO/TC 45 on Rubber. A test method for latex films has been prepared and is also being discussed with ISO/TC 45.

Methods of Measuring mill-roll and stock temperatures during processing of experimental rubber batches are being studied by Subcommittee X on Physical Tests. Better control of such temperatures is considered essential for improving reproducibility in preparation of standard compounds and in experimental batches for testing. Methods of buffing rubber specimens in order to improve accuracy and reproducibility in testing are also under study.

Determination of Copper

The procedures for determining copper and manganese in the analysis of rubber products was approved at the June meeting and will be incorporated in ASTM Methods D 297. Work is now being undertaken on a method for determining iron in crude rubber. A task group is being organized to study methods of determining carbon black in vulcanized rubber. The induction furnace combustion method for determination of sulfur is being studied. In view of interest expressed in the use of infrared methods for analysis of elastomeric compounds, a report on such methods will be prepared during the year.

The Subcommittee on Crude Natural Rubber has developed a program for the vulcanization characteristics of natural rubber. Round-robin tests in seven laboratories will be made on three groups of technically classified rubber. The Mooney viscometer method will be used to determine whether it will provide accurate and reproducible information.

The Subcommittee on Abrasion Tests has been endeavoring to determine the type of abrasive and procedure for obtaining it for use in connection with ASTM Method D 394.

A questionnaire circulated to members of the subcommittee resulted in the following general classifications: (1) the two major difficulties encountered with abrasives are nonuniformity and smearing; (2) cutting rate is important, but neither a fast nor a slow cutting abrasive is desired; (3) a small majority of the respondents favored a commercial abrasive rather than the establishment of a specially prepared abrasive, and (4) those few expressing an opinion regarding criteria of acceptance for an abrasive favored standardizing the abrasive against a standard reference material. The subcommittee is continuing its study of a satisfactory abrasive paper for this method.

The Subcommittee on Hardness, Set and Creep has appointed a task group to standardize the Shore D durometer for use in testing stocks of more than 95 Shore A durometer hardness. Another section is planning a program to study the durometer hardness versus the ISO hardness scale to determine which is the most reproducible for testing a variety of elastomer stocks. A statistical review of this program will be made before the work is begun. A Bibliography on Creep and Relaxation of Elastomers has been prepared including results of tests on 30 GR-S samples together with illustrations of equipment used. This information will be studied during the year before a full-scale program is undertaken.

The Subcommittee on Adhesion Tests is making an extensive study of the Tentative Methods of Test for Adhesion of Vulcanized Rubber to Metal (D 429). Cooperative test results so far obtained will be reviewed by the D-11 Subcommittee on Statistical Control, particularly as regards the significance of the test results. Information regarding variables involved in the test will be studied. Items planned for revision include the thickness of the rubber section and the area of the test specimen.

A new bend test for friction materials bonded to metal will be voted on by the Subcommittee on Cements and Related Products for inclusion in the Tentative Methods of Testing Adhesives for Brake Lining and Other Friction Materials (D 1205). Consideration is being given to methods for testing wet film thickness.

The drop-ball method for impact resistance of hard rubber products is under study as an alternate impact test for inclusion in the Tentative Methods of Testing Hard Rubber Products (D 530). Use of the extensometer for determination of elongation of hard rubber is being investigated. Analytical procedures for determining soluble iron in hard rubber are being studied by several cooperating laboratories for possible inclusion in Methods D 530.

Composition Battery Containers

Methods for determining failure in the hot-cold cycle for asphalt composition battery containers (D 639) are being further investigated. Results of acid absorption tests using the proposed new edge coating material indicate that a good seal of the cut edges of the specimens is being obtained. The task group will prepare a standard set of samples for further testing in various laboratories using the proposed test method and sealing material.

The Subcommittee on Coated Fabrics is enlarging its program of work as a result of increased interest in these materials. The personnel of the subcommittee is being enlarged to include representatives from other interested ASTM committees. The present test procedures in the Tentative Methods of Testing Rubber-Coated Fabrics (D 751) are considered satisfactory except that for the adhesion test.

A questionnaire covering points requiring further study in connection with the adhesion test will be circulated in the subcommittee. While present ASTM procedures for light aging, oxygen bomb aging, oven and pressure heat aging, as applied to the testing of coated fabrics, are considered generally satisfactory, the subcommittee believes that a better means of evaluating the end point should be studied.

It also proposed that a test for cold

cracking, plasticizer loss, and stiffness measurements of synthetic elastomers should be studied in cooperation with Committee D-20 on Plastics. Further work is needed on abrasion tests of coated fabrics using both the Stoll and Schiefer machines. The abrasion methods prepared by Committee D-13 on Textile Materials will be reviewed in this connection.

A test method for scrub testing of coated fabrics utilizing the equipment described in the R. T. Vanderbilt Co. Handbook is being investigated at the request of the committee on aeronautical fabrics of the Society of Automotive Engineers.

The Sub-Committee on Low-Temperature Tests has appointed a task group to revise the Tentative Recommended Practice for Conditioning of Rubber and Plastic Materials for Low-Temperature Testing (D 832) as regards the temperature for maximum crystallization rate and to consider also the inclusion of construction details for a constant temperature liquid testing bath. Standard test temperatures of —55, —40, —25, —10, and +23 have been recommended for inclusion in this future revision.

A proposed revision of the Tentative Method of Test for Low-Temperature Brittleness of Rubber and Rubberlike Materials (D 736) to specify a standard exposure period of 5 hours in place of the 95-hour exposure period for natural rubber was recommended for committee letter ballot.

May Reactivate Program

The Subcommittee on Standard Samples has considered reactivating its program for establishing the remainder of the standard compounded ingredients required to prepare the standard formulations now covered in the Tentative Methods of Samples Preparation for Physical Testing of Rubber Products (D 15).

The suppliers of the various ingredients not yet standardized are being asked to donate the materials for this program. Favorable replies have been received from suppliers of conducting black, whiting and Silene EF, neoprene and nitrile rubber. The National Bureau of Standards is proceeding with the necessary arrangements and test to set up standard lots of these materials.

Certain changes in standard formulations have been discussed including the following: (1) change the acetylene black used in electrically conducting natural rubber stock to a conducting furnace black such as Vulcan C; (2) change from neoprene GN to W or WRT; (3) change the GR-S recipes from 122°F. to LTP type.

The subcommittee will consider the addition of recipes loaded with HAF black based on both natural rubber and GR-S. The NBS has added a standard for testing work in the government synthetic rubber program—a standard HAF black designated as standard sample No. 378.

The SAE-ASTM Technical Committee on Automotive Rubber has completed a revision of the SAE specifications for V-belts and pulleys and also a Recommended Practice for V-Belt Drives. A revision of the Specifications for Automotive Rubber (D 735) has been approved, changing the elongation values for the 80 durometer stocks in Table I, Class R. A revision in Specification D 735 replacing the letter K (adhesion test required) to K_1 (adhesion test required, elastomer to metal bond made during vulcanization process), and K_2 (adhesion test required, cemented bond, made after vulcanization process), was approved and is now being referred to Committee D-11 and the SAE for appropriate action.

The SAE-ASTM Specifications for Non-metallic Gasket Materials for General Automotive and Aeronautical Purposes (D 1170) are to be further revised by the addition of six additional grades of gasket materials. The Section on Vibration Insulators has compiled the results of a round-robin study of tests for resilience and hysteresis made with the Yerzley oscillograph. The results varied appreciably and causes of these variations are now being studied.

New specifications for power steering hose are being developed. Revisions in the specifications for coolant hose and for hydraulic brake hose are under consideration. The Section on Hydraulic Brake Cups has prepared specifications for a master brake cylinder cup, also a change in the present cold test, and a corrosion test. Another section is studying revisions of the recently completed specifications for oil seals, published by the SAE.

The Section on Finish Standards has reached the stage of its work where certain typical mold items are being selected, and the proposed finish specification will be applied to blueprints. The Section on Automotive Mats is considering specifying fadeometer and weathering tests for vinyl-coated mats, a means of measuring abrasion, methods of making a water spotting test, and a method for cleanability.

GENERAL TIRE DEDICATES $6,000,000 POLYVINYL CHLORIDE RESIN PLANT

On October 21, General Tire & Rubber Co., Akron, Ohio, dedicated its new $6,000,000 polyvinyl chloride resin plant at Ashtabula, Ohio. An aerial view of the new plant is seen above. With production underway, the company is said to rank as the world's largest integrated manufacturer of plastic film and plastic sheeting. Last April 30, the Bolta Corp. of Lawrence, Mass., and the Textileather Corp. of Toledo, Ohio, were merged into General Tire. Frank J. Lausche, Governor of Ohio, was dedication speaker at special ceremonies at the plant. Ground was broken in August, 1953, on a 45-acre tract which provides room for further expansion. The plant's 14 major operating buildings and eight auxiliary buildings are geared for an annual production of 25,000,000 pounds of polyvinyl chloride resin. There are about 150 persons employed at the plant, including 30 administrative and supervisory employees and 120 operating employees. The Ashtabula plant is of concrete and steel construction, with corrugated transite roofing and walls in the manufacturing area for increased fire protection.

Approved Equipment Activities

Approved Equipment Manufacturing Co. of North Bergen, N. J., advises that at the present time it has 75 employees involved in the production of extruded rubber tubes and in the weaving of jackets for fire hose. The company states that it has a minimum production capacity of 3,000,000 feet of fire hose per year. Blaze Guard Manufacturing Co. and the Universal Fire Hose Manufacturing Co. are divisions of Approved Manufacturing. It is suggested that users of the RUBBER RED BOOK adjust their copies with respect to the number of employees at the company.

100,000 MILES ON NEW TIRES REPORTS GOODRICH EXECUTIVE

According to J. E. Powers, manager of truck tire sales for the B. F. Goodrich Co., the long-awaited "dream day" when truck tires travel 100,000 miles without a recap has quietly become a reality. In the past two years, Mr. Powers said, he has received reports from truck operators throughout the nation attesting to 100,000 and more miles of use from a new tire designed for tractor-unit wheel drives.

Mr. Powers said this tire, called the "Traction Express", has consistently delivered more original miles than the total for a regular tire plus a recap, in many types of service. Many truck owners have reported as high as 130,000 miles and several 160,000 miles on the original tread, he said.

He pointed out that the Traction Express tread is 25 to 50% thicker than treads in ordinary truck tires, yet, because of new developments in rubber compounding, the tire still runs cool. A new design concept is used to compress the rubber in the tread to make it still more wear-resistant, and the tread pattern itself is composed of transverse cleats designed to provide excellent traction while slowing tread wear.

Mr. Powers said that this tire, outgrowth of a testing program that started in 1949, is an outstanding example of how the rubber industry is striving to help truckers keep operating costs down by building more miles into tires. In fact, he said, more and more fleet owners are buying their tires "by the mile". That is, figuring the cost of their tires in terms of the mileage they give, rather than evaluating costs from the actual price of the tires.

Mr. Powers said that truck tire sales, which dipped during the first six months of this year, are expected to show an increase in the second half. One of the reasons for this is that truck operators who kept inventories at a minimum to reduce capital investments are starting to buy again.

The original 1954 industry-wide forecast for truck tire sales was 8,800,000 tires, an expected 6% increase over last year's deliveries. During the first half of this year, he said, truck tires sold at a rate of 7,800,000 a year, but with deliveries picking up there is a good chance that the 1954 totals will come close to last year's 8,271,000. Mr. Powers also pointed out that about 4,000,000 truck tires are expected to be recapped this year. This is about one recap for every two trucks on the road.

Textile Mill Anniversary

The Rockmart, Ga., textile mill of the Goodyear Tire & Rubber Co. was to have celebrated its 25th anniversary at special ceremonies on November 12 and 13 in Rockmart. The two-day event by employees was to have included an open house party for the general public on November 12, with a parade, barbecue and other festivities for the employees and their families on the following day.

Selby Joins C. P. Hall

H. E. Selby

H. E. Selby has joined the technical sales staff of the C. P. Hall Co., Akron, Ohio. He will be concerned with product development and technical service, particularly in the wire and cable field. He is former vice-president of the Bishop Manufacturing Corp., and consultant to the rubber and plastic industries. He was previously associated with the General Cable Corp., the International Plastics Corp. and the McCordi Corp.

Swedish Group Plans Meeting

The meeting of the Swedish Rubber Technological Union, which will be held in Stockholm, Sweden, on November 26 and 27, will feature a symposium on carbon black. A program including the presentation of seven papers has been planned, each paper to be 10 to 15 minutes long. A 15 minute question and answer period will follow the presentation of each paper. Papers scheduled for presentation include the following:

"Types of Carbon Blacks—Manufacturing Processes and General Properties" by J. Williams (Phillips Chemical—England).

"The Structure and Reinforcement of Carbon Blacks" by C. W. Sweitzer (Binney & Smith).

"Dynamic Properties of Carbon Black Loaded Natural Rubber Compounds" by Dr. Westlinning (DeGussa—Germany).

"Blends of Carbon Blacks—Technical and Economic Aspects" by a representative of Rubber Stichting (Holland).

"Non-Staining Carbon Black" by H. Collyer (Godfrey L. Cabot).

"Pelletizing and Packaging and Its Influence on Dispersbility" by L. D. Carver (Witco Chemical).

"Future Trends in Carbon Black" by I. Drogin (United Carbon).

New Auto Factbook Published

The Automobile Manufacturers Association, New Center Building, Detroit, Mich., has announced the publication of the 34th edition of "Automobile Facts and Figures." As in the past, this 1954 edition contains all pertinent facts and figures on passenger cars, trucks and buses. Several new statistical records are reported in its 80 pages of charts and tables.

WASHINGTON INSTALLS OFFICERS; HOLDS SEVENTH ANNUAL BANQUET

The Washington Rubber Group held its Seventh Annual Banquet along with its installation of officers for the coming year on October 20 in the auditorium of the National Press Club in Washington, D. C. Approximately 110 members and guests attended the meeting. A social hour preceded the banquet, which was followed by dancing. The following members were elected to office for the coming year:

President: Paul Greer (Office of Synthetic Rubber); *Vice-President,* W. James Sears (RMA); *Secretary,* William Dunkle (Goodyear); *Treasurer,* Ethel Levene (Bureau of Ships); *Recording Secretary,* Rachel J. Fanning (NBS). The following members were elected as chairman of the committees noted: *Program,* Dr. Robert D. Stiehler (NBS); *Membership,* Charles Collins (Goodrich), *Publicity,* George W. Flanagan (Goodrich Chemical).

At the meeting, George Riveire (Goodyear), retiring president, made a short address reviewing the accomplishments of the group during the past year. In the absence of Mr. Greer, due to a death in the family, Mr. Sears acted on his behalf in introducing the other officers and committee chairmen to the group members.

Buffalo Holds Fall Meeting

The Buffalo Rubber Group held its Annual Fall Meeting on October 5 at the Hotel Westbrook in Buffalo, N. Y., with some fifty members and guests in attendance. The technical session was addressed by Robert Havenhill of the St. Joseph Lead Co., who spoke on "The Electrostatic Contact Potentials of Reinforcing Pigments". The speaker stated that the more positive the contact potential of the pigment, the better the reinforcement, since the rubber has a negative potential and hence, unlike forces attract. He gave a demonstration on an electrostatic modulator which indicated the contact potentiality of the materials. Mr. Havenhill also recommended methods of adding oils and pigments to the rubber in the Banbury mixer to secure better physicals. The after dinner speaker was Dr. Harry K. Fisher of the Natural Rubber Bureau, who delivered a talk on "Rubber Roads". Mr. Fisher emphasized that there is considerable data to be gathered before there is conclusive evidence as to the superiority of rubber-asphalt paving mixes.

Constructing Acetylene Plant

General Aniline & Film Corp., New York, N. Y., has announced that ground breaking ceremonies for the company's new $6,000,000 chemical plant got underway on November 4. The new plant, which is expected to be completed next year, will be the first installation in this country for commercial scale manufacture of chemical products developed from acetylene at elevated pressures, the company states. Officers of the company, government officials and leading industrialists attended the ceremonies which featured a luncheon, reception and a buffet dinner.

DETROIT GROUP HEARS ABERNATHY DELIVER PAPER ON ISOCYANATES

The Fall Meeting of the Detroit Rubber and Plastics Group, held on October 8 in the Detroit-Leland Hotel in Detroit, Mich., was attended by approximately 160 members and guests. Principal speaker of the meeting was H. H. Abernathy, assistant technical sales manager of the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Mr. Abernathy spoke on "Isocyanates and Their Reaction Products".

In his talk, Mr. Abernathy stated that isocyanates are not new chemicals. The role of isocyanates in polymer chemistry actually dates back to the 1930's, stemming from the same broad program of fundamental high polymer research that produced nylon and neoprene. DuPont chemists found that polyisocyanates were excellent building blocks by virtue of their ability to react with almost any compound containing active hydrogen, and obtained a number of basic patents in this field.

Several diisocyanates are now commercially available in this country, he stated. These materials will react with alkyd resins, other polyols, water, ureas, urethanes, amines, and various other compounds to form solid or cellular products which may be hard and tough, soft and plastic, or elastic. A wide range of products can be prepared by varying raw materials, reaction conditions, and mol ratios. Many other variables are also involved, so careful control of reactants and reaction conditions is necessary.

Experimentally Produced End-Products

A variety of end products have been produced experimentally in DuPont laboratories. Since DuPont's primary interest is in supplying polyisocyanates, the company does not intend to manufacture such end products commercially; they serve, however, to illustrate the versatility of the reactions and the outstanding properties that can be obtained.

One of these products is a rigid cellular material having a density of 10 to 20 pounds per cubic foot. It is strong and tough, and has some ability to recover from deformation. It is not brittle, has good resistance to shock and vibration, and good thermal insulating properties. These characteristics should make it an excellent structural material, particularly where high strength and reinforcement are needed, he opined.

Low-density foam (1.7 to 2.0 pounds per cubic foot) has also been made. The lightweight product has very respectable strength, and enough ability to elongate or compress before rupture to produce good resistance to shock and vibration. Like its heavier counterpart, it does not support combustion and has good oxidation resistance. Its thermal conductivity is low, sound absorbing ability is high, and electrical properties are good.

Both the heavy and low-density foams can be foamed in place at room temperature in complicated cavities, and they adhere tightly to a variety of metals, wood, glass, and fabrics, making it possible to prepare monolithic assemblies without the need for external heat. Spreading and spraying techniques may also be used.

Mr. Abernathy said that polyurethanes offer attractive possibilities in the field of resilient foam. A polyurethane foam at three pounds per cubic foot has a load-carrying capacity better than that of a commercial 60/40 natural rubber-GR-S latex foam at six pounds per cubic foot. In addition, the polyurethane foam has high tensile strength, and does not support combustion. Its ozone, oxygen, and flex resistance are also excellent. Their high load-carrying capacity at low density, excellent aging properties, and ability to be formed at room temperature make polyurethane resilient foams outstanding candidates in the cushioning field.

Urethane Rubber

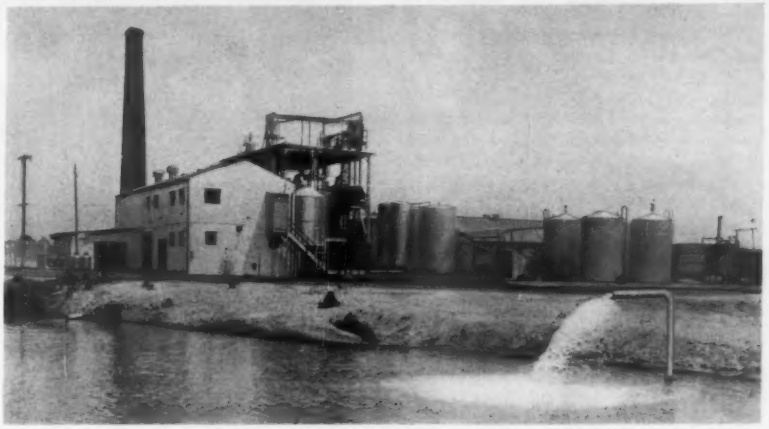
Another polyurethane product having an excellent chance for commercial success is urethane rubber. DuPont has made an experimental product of this type, trademarked "Adiprene." Since it is still in the laboratory stages of development, however, samples are not yet available.

This urethane rubber is very strong, has high modulus and hardness, and can be classified as an oil-resistant elastomer. The material displays good resistance to tearing, heat and oxidation, Mr. Abernathy declared.

The outstanding characteristic of urethane rubber is abrasion resistance. A tread of "Adiprene" B was applied to a buffed cured tire carcass with the aid of a special adhesive system. It was then cured in a conventional recapping mold and road-tested. After running 20,000 miles, mostly at 60 miles per hour, the wear was only about half that of a first line GR-S tire of the same size and design, he concluded.

The after-dinner speaker was Mr. W. N. (Nick) Kerbawy, general manager of the Detroit Lions Football Co. Approximately 210 persons heard his sparkling review and humorous presentation of many critical events in its organization and history. Motion pictures showing the highlights of the 1953 championship season concluded the program for the evening.

HATCO CHEMICAL COMPLETES FIRST YEAR AT NEW HEADQUARTERS IN N. J.



Hatco Chemical Co., Fords, N. J., has completed its first year at the new and larger headquarters located on a 64-acre tract in Fords. The multi-million pound per year plant comprises three buildings, in addition to out-of-doors reactors and storage tanks. A separate building houses the business offices of the company. The photograph above shows the manufacturing plant and the reactors. The plant's chemical equipment consists of several large vessels, as well as pilot scale facilities, all capable of operating under varying conditions of temperature and pressure. A wide variety of organic chemicals, including alcohols, glycols, acids, amines, esters, and ketones can be processed. Shipping facilities are provided for small packages, drums, tankcars, and tankwagons. Hatco Chemical's technical staff is skilled in the production and use of chemicals employed in the processing of vinyl plastics, synthetic rubbers and other elastomers, and also chemicals used in the textile, detergent, paper, leather and pharmaceutical industries. A number of new products are now under development, the company states, and it is understood that these products will be introduced commercially in the near future.

Neoprene Shipping Unit Loads

The Organic Chemicals Department of the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has announced that equipment for unitizing neoprene shipments is being installed at the Louisville, Ky., plant, and that limited shipment of a few types in this manner has already begun. To make stacking of the bags on the pallets easier, the neoprene is cut into pieces 1 to 1½ inches long instead of the 11 to 13 inch lengths previously used. The new neoprene unit load has a base size of 40 by 48 inches and is 30 to 36 inches high. Forty 50 pound bags are spot pasted and stacked on a fiber board which serves as a pallet. Standard fork-lift trucks equipped with chisel forks can be used to remove unit loads from both truck trailers and boxcars.

AKRON GROUP HOLDS SYMPOSIUM; PRESENTS PLAQUES TO CHAIRMEN

The Akron Rubber Group and the Cleveland-Akron Section of the Society of Plastics Engineers held a joint Fall Meeting on October 22, at the Mayflower Hotel in Akron, Ohio. The meeting featured a symposium on "Plastic and Rubber Foam", and the non-technical portion of the meeting was "Past Chairman's Night".

Dr. J. N. Street (Firestone) acted as moderator for the panel discussion. Panel members included: William Shock (Dow Chemical), W. H. Ayscue (DuPont), William Mannering (Goodrich Chemical), Robert Courtney (Bakelite), Tom Rogers (Goodyear), H. Beckerlag (Fisher Body), and R. A. Maurer (Kenmar Mfg.). A full report on the panel discussion will appear in a future issue of RUBBER AGE.

A dinner followed the technical portion of the meeting. Following dinner, four Akron University students who were recipients of this year's Akron Group scholarships were introduced. V. L. Petersen (Goodyear), chairman, then introduced Dr. R. P. Dinsmore and presented him with a plaque in recognition of his service as the first presiding chairman of the Akron Group. A photograph of the bronze plaque presented to Dr. Dinsmore is shown elsewhere on this page.

Dr. Dinsmore, in turn, then presented similar plaques to the past chairmen who were present and also gave a fitting tribute to A. E. Warner, the only past-chairman who is deceased. Plaques were presented to the following: H. A. Winkelmann, G. K. Hinshaw, C. W. Sanderson, H. J. Conroy, H. A. Bourne, C. A. Carlton, G. L. Allison, R. T. LaPorte, and H. V. Powers.

Also, L. V. Cooper, T. L. Stevens, A. E. Sidnell, W. J. Krantz, E. B. Busenbery, R. M. Vance, H. F. Palmer, C. A. Ritchie, E. L. Stangor, D. F. Behney, L. M. Baker, and R. H. Marston. It was announced that similar plaques had been sent to four past-chairmen who were not present at the meeting: P. P. Crisp, A. Brill, E. H. Baker and J. R. Moore.

As an added attraction, members were shown a complete movie of the last Akron Rubber Group Summer Outing.

Addresses Libraries Association

Miss Lois W. Brock, research librarian of the General Tire & Rubber Co., Akron, Ohio, was a featured speaker at the Fall Meeting of the Special Libraries Association held on November 4 at the Conrad Hilton Hotel, Chicago, Ill. Addressing a meeting of the Metals Division, Miss Brock discussed the handling of patents in the small technical library. Her address was part of a symposium on the small metallurgical library. The meeting was held in conjunction with the National Metals Exposition which took place at the International Amphitheatre in Chicago on November 1 through 5.

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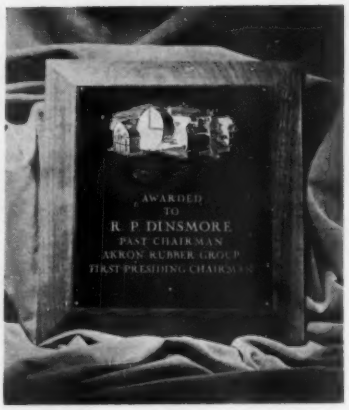

Shown here is the plaque presented to Dr. Dinsmore in recognition of his service to the Akron Rubber Group.

High Polymer Lecture Series

The Division of Organic and Fibrous Materials of the National Bureau of Standards, Washington 25, D. C., is sponsoring a series of six lectures on the Chemistry and Physics of High Polymers. The meetings will be held on the Bureau grounds, in the Materials Testing Laboratory, at 2:30 P.M. on the designated days, and are open to the public. The first lecture of the series, scheduled for November 1, consisted of a paper on "Relaxation Processes in Dilute Polymer Solution" by Bruno H. Zimm (G-E). The five other lectures are scheduled on these dates:

December 6—"Peroxides as Initiators of Chain Reactions" by Arthur Tobolsky (Princeton University).

February 7—"Some Fundamental Properties of Polymer Latices" by Turner Alfrey, Jr. (Dow Chemical).

March 7—"The Physical Chemistry of Macromolecules Having Helical Configuration—Polypeptides, Nucleic Acid, and Collagen" by Paul Doty (Harvard University).

March 28 — "Nuclear Magnetic Resonance and Structure of Polymers" by H. S. Gutowsky (University of Illinois).

May 2—"Mechanism of Degradation and the Fine Structure of Cellulose" by Eugene Pacsu (Princeton University).

Boston Holds Fall Meeting

The Fall Meeting of the Boston Rubber Group was held on October 15 at the Somerset Hotel in Boston, Mass. The afternoon technical session was attended by approximately 170 members and guests and consisted of a panel discussion on special elastomer problems of the Armed Forces. The moderator of the panel was Dr. Warren Stubblebine of the Connecticut Hard Rubber Co. Dr. Juan C. Montermoso, Dr. J. Horace Faull, Jr., and E. R. Bartholomew, represented the U. S. Army, Navy and Air Force, respectively. Following an intermission, a dinner was held attended by some 270 members and guests. Cedric Foster, noted news commentator, was guest speaker at the dinner.

ONTARIO RUBBER SECTION HEARS McLEOD SPEAK ON ALFIN RUBBERS

The October 5th meeting of the Ontario Rubber Section of the Chemical Institute of Canada, held at Wally's Restaurant in Toronto, featured an address by Dr. L. A. McLeod of the Polymer Corp., Ltd., Sarnia, Ont. Dr. McLeod spoke on "Development of Alfin Rubber". The meeting featured a pre-dinner cocktail party with the Polymer Corp. as host. D. Seymour and Tom Davies, both of Polymer, handled arrangements.

In his address, Dr. McLeod disclosed that Alfin polymers are being prepared regularly in pilot plant equipment. By copolymerizing with sufficient styrene and masterbatching with oil, a material which is processible has been evolved. Dr. McLeod stated that laboratory evaluation has shown that compounds of this masterbatch have satisfactory physical properties.

The speaker reported that the tensile, tear, and hysteresis are essentially the same as for a standard oil masterbatch, while the modulus is very much lower and the flex life is much higher than for other standard polymers. The difference in these last two properties, he pointed out, may yet show the superiority of this polymer in certain applications.

Doerschuk Announces Retirement

Ernest A. Doerschuk, assistant treasurer of the B. F. Goodrich Co. since 1947 and for nineteen years prior to that time general credit manager of the company, will retire from active duty on December 1 after more than 38 years' service. Born in Philadelphia, Mr. Doerschuk joined Goodrich shortly after his graduation from Ohio State University in 1916. His first assignment was in Buffalo as district credit manager and later he served as district credit manager in Boston. After overseas service in the U. S. Army during World War I, he returned to the company in 1919 and in 1920 became district credit manager in Chicago. In 1926, he was transferred to Akron as district credit manager and was named general credit manager of the company in 1927. Mr. Doerschuk was named assistant treasurer of the company in January, 1947. He is a trustee of the Akron Better Business Bureau, a member of Delta Upsilon Fraternity, the Portage Country Club, and is a member of the Masons.

Neoprene Technical Reports

The Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has announced two new technical reports, BL-264 and BL-265. BL-264 is entitled "Neoprene Cellular Soles" and discusses the compounding and processing of neoprene cellular soles. Typical compounds for both the single cure and the double cure methods are included. BL-265 is entitled "Practical, Water-Resistant Neoprene Compounds." Practical Neoprene Type WRT compounds are shown which have good rates of cure, good vulcanizate properties and low swelling in hot water.

NEW YORK ELECTS OFFICERS; HEARS LERNER AND McCOLLUM

Approximately 250 members and guests of the New York Rubber Group attended the October 22 meeting held at the Henry Hudson Hotel in New York City. The meeting featured an election of officers and an interesting address by M. E. Lerner, editor of RUBBER AGE, on "Some Observations on the European Rubber Industry". The meeting was also addressed by O. H. McCollum of the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Mr. McCollum spoke on "The Processing Characteristics of Hypalon Chlorosulfonated Polyethylene". The following members were elected to office for 1955:

Chairman, S. H. Martin, Jr. (Thiokol); *Vice-Chairman*, J. H. Provost (U. S. Rubber); *Secretary-Treasurer*, B. B. Wilson (Rubber World). T. A. Bulifant (Barrett Division) was elected sergeant-at-arms. S. H. Tinsley (R. T. Vanderbilt), Irving Laurie (Laurie Rubber Reclaiming), C. V. Lundberg (Bell Laboratories) and C. J. Moran (Versatile Products) were elected to the Executive Committee for a three-year term. I. Rubiner (Metal Hose & Tubing) was elected to the Executive Committee for a one-year-term. Ex-officio members of the Executive Committee are Joseph Breckley (Titanium Pigment) and Peter P. Pinto (RUBBER AGE).

The following group members served on the Nominating Committee: *Chairman*, Dr. L. J. Radi (R-B-H Dispersions), E. S. Kern (R. T. Vanderbilt), H. J. Peters (Bell Laboratories), J. R. Keating (Binney & Smith), and R. R. Lewis (Vulcan Rubber Products).

Recounts Personal Experiences

In his address, Mr. Lerner recounted some of his personal experiences and observations while on a recent nine-week tour of England and the Continent. The speaker escorted his audience on a tour through several of the many rubber factories and laboratories he visited on his trip. Highlights of the trip were pointed up by the use of slides.

Mr. Lerner made some observations as to the comparative efficiency of European and American manufacturing processes and gave his audience some idea of the size and scope of the European rubber industry. He also discussed some of the outstanding personalities in the rubber industry he visited with while abroad. (EDITOR'S NOTE: A series of articles on Mr. Lerner's trip began in the October, 1954, issue of RUBBER AGE, and continues in this edition).

Mr. McCollum, in his paper on "Processing Characteristics of Hypalon Chlorosulfonated Polyethylene" stated that Hypalon is finding application in a wide variety of products which require, in aggregate, most of the known factory processing methods in their manufacture. He observed that the processing characteristics of Hypalon can best be evaluated by comparing some of the physical properties of the polymer with those of natural rubber, GR-S, and neoprene.

Although Hypalon, unlike the other three elastomers, does not "break down" with mechanical treatment, its relatively low Mooney viscosity and high thermoplasticity permit rapid mixing and simplify injection molding. Because of these properties, Mr. McCollum said, softeners and chemical plasticizers are of minimal importance.

Scorch resistance and curing rate are controlled less readily in Hypalon because of the lack of retarders and small number of accelerators available, the speaker declared. With continued compounding and processing development, rubber manufacturers will be able to use Hypalon efficiently and produce products having the special features inherent in this new polymer, he concluded.

At the conclusion of the technical portion of the meeting, the group members and their guests enjoyed a cocktail hour which was followed by the serving of dinner attended by 200. After-dinner entertainment was supplied by Harry Lorayne and Renee, "The Memory Marvels", who gave a most interesting and amusing performance.

Coming Events in the Rubber Industry

Nov. 17. Washington Rubber Group.

Nov. 18. Rhode Island Rubber Club, Fall Meeting, Metacomet Golf Club, East Providence, R. I.

Nov. 28-Dec. 3. American Society of Mechanical Engineers, Annual Meeting, Statler Hotel, New York, N. Y.

Dec. 2. Fort Wayne Rubber and Plastics Group.

Dec. 3. Los Angeles Rubber Group, Xmas Party, Ambassador Hotel, Los Angeles, Calif.

Dec. 7-8. Society of the Plastics Industry, Fifth Film, Sheeting and Coated Fabrics Division Conference, Hotel Commodore, New York, N. Y.

Dec. 8. Buffalo Rubber Group, Xmas Party, Buffalo Trap and Field Club, Williamsville, N. Y.

Dec. 9. Northern California Rubber Group.

Dec. 10. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 10. Detroit Rubber & Plastics Group, Xmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 10. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 17. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Dec. 18. Southern Ohio Rubber Group Xmas Party.

Jan. 28, 1955. Akron Rubber Group, Winter Meeting, Mayflower Hotel, Akron, Ohio.

Jan. 31-Feb. 4, 1955. American Society for Testing Materials, Committee Week, Netherland Plaza Hotel, Cincinnati, Ohio.

Feb. 8-10, 1955. Society of the Plastics Industry, Reinforced Plastics Division Conference, Hotel Statler, Los Angeles, Calif.

Feb. 18, 1955. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Feb. 22-23, 1955. Society of the Plastics Industry of Canada, Thirteenth Annual Canadian Conference, Hotel London, London, Ontario.

Mar. 18, 1955. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Apr. 1, 1955. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Apr. 13-15, 1955. Society of the Plastics Industry, Pacific Coast Section Conference, Palm Springs, Calif.

Apr. 29, 1955. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

May 4-6, 1955. Division of Rubber Chemistry, A.C.S., Spring Meeting, Sheraton-Cadillac Hotel, Detroit, Mich.

May 7-15, 1955. Society of the Plastics Industry, Annual Meeting and Conference, Cruise on "Queen of Bermuda."

June 17, 1955. Akron Rubber Group, Summer Outing, Firestone Country Club.

June 19-23, 1955. American Society of Mechanical Engineers, Diamond Jubilee Semi-Annual Meeting, Hotel Statler, Boston, Mass.

June 26-July 1, 1955. American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

Nov. 2-4, 1955. Division of Rubber Chemistry, A.C.S., Fall Meeting, Bellevue-Stratford Hotel, Philadelphia, Penna.

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TRACERLAB SPONSORS THREE-DAY SYMPOSIUM ON RADIOACTIVITY

The Technical Division of Tracerlab, Inc., Boston, Mass., sponsored a three-day symposium on "Applications of Radioactivity in the Rubber and Plastics Industries" on October 6 through 8 at the Sheraton Plaza Hotel in Boston. The primary objective of the symposium was to acquaint members of the rubber and plastics industries with the past uses, and possible future applications, of radioisotopes in research, development and process control.

The first day of the symposium was devoted to orientation talks directed to those persons who are contemplating the use of radioisotopes. John W. Irvine, Jr., associate professor of nuclear chemistry at the Massachusetts Institute of Technology, was chairman of this session. W. E. Barbour, president of Tracerlab, delivered the welcoming address. The day's activities also featured a cocktail hour and a banquet. Dr. George E. Manov of the Atomic Energy Commission was principal speaker at the banquet.

The first paper on October 6 was delivered by P. C. Aebersold of the Atomic Energy Commission, Oak Ridge, Tenn. Mr. Aebersold spoke on "The Role of the Atomic Energy Commission in the Industrial Use of Radioactivity". The speaker stated that the AEC performs the dual role of fostering widespread use of reactor-produced radioisotopes and controlling their use in the interest of public health. The two activities have been kept balanced in such a way that these highly beneficial but potentially hazardous tools are being safely used in thousands of institutions.

Industrial Firms Lead Users

Mr. Aebersold stated that industrial firms now lead all other types of using institutions, their number having grown from 100 at the beginning of 1950 to about 1,000 at present. The variety of uses to which these firms are applying radioisotopes well illustrates the versatility of these tools, he emphasized. Although differing greatly among themselves, any such use is based on one of three principles. These may be briefly stated as: (1) radiation affects materials, (2) materials affect radiation, and (3) radiation traces materials. Examples in each category are (1) excitation of phosphors and polymerization, (2) radiography and thickness gaging, and (3) tracing of pipeline flow and studies of reactor mechanisms.

W. C. Peacock of Tracerlab also delivered a paper on the first day of the symposium. His paper was entitled "Fundamentals of Radioactivity". The speaker described the pertinent fundamental concepts of radioactivity and introduced and explained about forty basic words or terms that were used throughout the symposium.

F. H. Low, also of Tracerlab, then spoke at the symposium, delivering a paper on "Instrumentation for Radioactivity Work". Mr. Low observed that the rapid expansion of the laboratory use of radioactive isotopes and the accompanying developments in laboratory technique have brought with them a wide selection of instrumentation for nuclear work. He stated that the types of equipment needed for radioisotope work can generally be divided into five groups: (1) counting equipment; (2) sample preparation equipment; (3) reference standards; (4) personnel protection and survey equipment, and (5) "hot lab" and storage equipment.

At the conclusion of his talk, composite groups of equipment were shown which might represent the total nuclear instrumentation requirements for some typical applications.

Health Considerations

C. R. Williams, another of the speakers from Tracerlab, for his portion of the meeting, spoke on "Health Physics Considerations". He stated that any planning for using radioisotopes in either research or production must take into consideration requirements necessary to protect the health of employees and the public. There are two major health problems in the use of radioactive materials, Mr. Williams stated. One of these is radiation from external sources, and the second results from inhalation and/or ingestion of radioactive materials which may deliver the radiation locally to specific organs. The speaker outlined several control methods currently being employed.

"Establishing a Radioisotope Laboratory" was the title of the paper delivered by Edward Shapiro, also of Tracerlab. Mr. Shapiro stated that once a company has decided to undertake an experimental program using radioisotopes, it must consider where the work is to be done and what special facilities will be required. Thorough planning is essential and a well planned laboratory will facilitate the attainment of a successful research program.

Mr. Shapiro showed a moving picture entitled "Practice of Radiological Safety", which took the viewer on a visit through a radioisotope laboratory. It covered the handling of radioisotope shipments, preparation of therapeutic doses, the need for and function of a local radioisotope committee, laboratory design, decontamination, use of shielding, measurement of personnel exposure, and other matters pertinent to health safety.

Isotopes and Labeled Compounds

Seymour Rothchild, another of the speakers representing Tracerlab, spoke on "Isotopes and Labeled Compounds" at the session on October 6. Mr. Rothchild noted that the considerations leading to the choice of a labeled compound for a given experiment are the: (1) availability of the isotope; (2) half life of the isotope; (3) specific activity of the compound required for the application; (4) cost of the radioactivity required; (5) problem of incorporating the isotope in the chemical form desired; (6) health hazards involved in handling the isotope, and (7) techniques to be used to measure the radioactivity. He also listed the radioisotopes of greatest interest to the rubber and plastics industries which are available from the Oak Ridge National Laboratories.

Hiram McCann, editor of *Modern Plastics*, served as chairman of the session on October 7. The first paper delivered on that date was entitled "Gamma Radiation as an Initiator for Polymerization Reactions" by D. S. Ballantine of the Brookhaven National Laboratory. The speaker declared that gamma radiation may be used to initiate addition type polymerizations which are presently initiated by more conventional initiators, such as heat, ultraviolet light, and organic or inorganic catalysts. It has been shown by several investigators, he stated, that the reactions proceed by a free radical mechanism.

Gamma radiation would seem to offer possible unique advantages in certain monomer systems, the speaker declared. Mr. Ballantine discussed the results obtained from several investigations from the point of view of the advantages offered by gamma radiation.

"Polymerization by Various Types of Radiation—A Comparative Study" was the title of the paper delivered by Gerald Oster of the Institute of Polymer Research, Polytechnic Institute of Brooklyn, at the session on October 7. Mr. Oster noted that certain free radicals will initiate the chain polymerization of vinyl monomers. These radicals, he stated, must be capable of converting the monomer into a free radical. For a given radical-monomer combination, the velocity of the polymerization and the size of the final polymer will depend upon the rate of the termination step.

Rate of Termination

Mr. Oster observed that the rate of termination is determined by (1) the concentration of the free radicals, (2) their specific distribution, and (3) the diffusion constant of the free radicals in the medium. The first two factors will depend on the nature and dosage of the ionizing radiation employed. The third factor depends on the viscosity of the medium and whether or not the system contains surfaces which can adsorb the radicals, Mr. Oster declared.

A critical examination in the light of these factors was made of the published work in vinyl polymerization initiated by alpha-, beta-, gamma-, and X-rays, and by neutrons.

K. H. Sun of the Westinghouse Research Laboratories also delivered a paper on October 7. His paper was entitled "A General Survey of Effect of Atomic Radiations on High Polymers". The speaker declared that the implications of atomic radiation are far reaching in their practical respect. Understanding of the damaging effects has already resulted in development of high polymers that will withstand intense radiation.

Studies of beneficial effects indicate that atomic radiation provides to the scientific and technical world a new experimental variable or tool unique in itself. Already, high polymers of better physical or chemical properties are produced that cannot be achieved otherwise, he noted. Mr. Sun also

gave a brief review of various radiation sources.

The October 7 session also featured a paper by L. H. Peebles, Jr. of the Chemstrand Corp., entitled "The Kinetics of Vinyl Acetate Polymerization in Benzene". The speaker discussed the mechanism and kinetics of polymerization of vinyl acetate in the undiluted state and in benzene solution.

He stated that in order to correlate the rate of polymerization in benzene solution with the molecular weight of the polymer, it is necessary to depart from the conventional kinetics and to assume that a vinyl acetate radical can add to the benzene nucleus and the chain can then be continued by further addition of vinyl acetate monomer, leaving a cyclic diene copolymerized into the vinyl acetate chain.

In order to verify whether benzene does indeed copolymerize in this fashion, vinyl acetate was polymerized in the presence of ring labeled benzene — C^{14} and the radioactivity of the resultant polymer was in highly satisfactory agreement with the amount calculated from the kinetics, Mr. Peebles stated.

"The Application of Radioactive Tracer Techniques to Plastics Mold Erosion Study" by A. P. Landall of the General Electric Co., was another of the papers delivered at the October 7 session. Mr. Landall stated that mold erosion has plagued the plastics industry since the early days of this industry. Hardening and chrome plating of steel, he declared, have not solved the problem of mold wear. Radioactive tracer techniques suggested themselves as being the possible answer to this problem. Mr. Landall outlined some of the work being done in this direction and the results obtained to date.

Discusses Nuclear Batteries

Alexander Thomas of Tracerlab, for his part in the symposium, delivered a paper on "Nuclear Batteries". Three types of nuclear batteries were described with emphasis on the contact potential difference (CPD) gaseous ionization type being developed by Tracerlab for the Signal Corps. This CPD type is intermediate between the β current type, which gives high voltage at relatively low current, and the junction diode type, which gives low voltage at relatively high current, the speaker noted.

The construction of experimental models of the CPD type was discussed and the speaker outlined company experience to date with polystyrene, polymethylmethacrylate, and polyfluoroethylene insulators in a qualitative way. Several demonstration devices were shown to illustrate the extremely small amount of power that is developed by these nuclear batteries.

"The Application of Radioactivity to the Studies of Solvation and Migration Rates of Plasticizers" by J. Kalinsky, B. Gilbert, and W. F. Lauro of the New York Naval Shipyard, was the last paper presented on October 7. Mr. Kalinsky, who delivered the paper, stated that radioactive tracer techniques have been applied to the studies of solvation and migration rates of plasticizers of various synthetic plastics and elastomers. Some of the results obtained from these studies were outlined by the speaker.

Driving Costs Estimated

According to the result of a special study in Summit County, Ohio, by a research subcommittee of the United Community Council, it costs 8.6c per mile to drive a car. The figure was attained by adding fixed costs to the operating costs of the three "light" cars in the field, using an average of 10,000 miles a year over a five-year period. The fixed cost per mile was put at 4.57c, while the operating cost per mile was put at 4.1c. Some 52 social agencies in Summit County furnished data for the study.

Jerome D. Luntz, editor of *Nucleonics*, acted as chairman for the session on the last day of the symposium, October 8. The first paper on that day was entitled "Tracer Measurements of Molecular Migration" and was presented by S. D. Gehman of the Goodyear Tire & Rubber Co. Mr. Gehman observed that tracer methods are natural for many scientific and industrial problems involving the solubility, diffusivity, and migration of materials. He offered a brief review of some of the techniques which have been used which served to show the range of adaptability, general principles and characteristic results.

The next paper presented at the session on October 8 was entitled "Penetration of Moisture Into Attached Protective Coatings" by G. D. Calkins, Meyer Proberskin, V. E. Young and L. J. Norwacki, Battelle Memorial Institute. The authors revealed that a method of measuring the penetration of water vapor into attached protective coatings has been developed. Water containing hydrogen-3, tritium, was used as a radioactive tracer in this study.

A special polishing technique enabled the removal of uniform layers of coating. Each newly exposed surface was radioassayed for tritiated water content. The radioassay data provided a measure of the tritiated water vapor penetration in the film.

Liquid Level Measurement

S. Barnartt and K. H. Sun of the Westinghouse Electric Corp., next presented a paper on "Measurement of Liquid Level by Neutron Detection". It was stated that with a "point" source of fast neutrons (Po-Be) inside or outside a body of hydrogeneous liquid, the level of the liquid can be determined by scanning outside the container with a slow neutron counter containing B^{10}. Curves of counting rate versus counter position, in the neighborhood of the liquid level, were determined for various relative positions of the source. A break or inflection point in the curve indicated the liquid level. The results show that the level of a hydrogeneous liquid can be determined remotely to $\pm$ 2mm or better by the use of neutron detection.

L. Reiffel of the Armour Research Foundation next presented a paper on "Beta Ray Excited X-Ray Sources for Thickness Gauging". The author declared that beta ray emitting radioisotopes may be used to generate moderate amounts of X-radiation by permitting the betas to bombard suitable target nuclei.

Typical X-ray spectral distributions were shown and a brief discussion of the theory of excitation was presented. The applications of the technique to a number of specific problems were also sketched by the author.

E. T. DePass of Johnson & Johnson also participated in the activities on October 8, presenting a paper entitled "Beta Gauging and Automatic Control". Mr. DePass stated that there are many factors which affect the design of a gauging and control system, and the practicable aspects in the selection and application of the component parts are all-important in arriving at a successful installation.

Control systems which are very simple in nature in many cases will provide adequate uniformity for the process involved, and as the process becomes more and more critical, the necessity for more and more accuracy will complicate the installation. In this regard, it is always advisable to choose the simplest installation which is compatible with the process that is involved.

The last paper on October 8 was presented by N. S. Foster of Congoleum-Nairn. This paper was entitled "The Use of A Beta Gauge in Continuous Web Thickness Measurement". The author outlined advantages inherent in the use of Beta ray gauges in the measurement of smooth rubber flooring and other industrial products.

French Order Dynamometer

Adamson United Co., Akron, Ohio, has completed a huge aircraft brake and tire testing machine for the French Government. Known as the "Dynamometer," the machine was developed by the company for simulating landing conditions to test tires and brakes. Weighing 150 tons and with a 10-foot flywheel, the device can simulate speeds up to 250 miles an hour. The company also designed a similar testing machine used by the British Government. Adamson United also has just completed negotiations with the Wright Air Development Center for the manufacture of a Dynamometer similar to the one shipped to France. The Air Force unit will be used for the same purpose but will operate at much higher speeds.

Obtains Tax Write-Off

It was recently announced that the Texas Butadiene and Chemical Corp. has obtained a 5-year 100% tax write-off from the Office of Defense Mobilization for $25,700,000 of the $30,000,000 cost of its aviation alkalites, butylenes and butadiene plant to be built on the Houston Ship Channel.

NAMES IN THE NEWS

DONALD E. MCINTIRE, associated with the B. F. Goodrich Co. since 1940, has been named chief accountant-manufacturing, in charge of all manufacturing accounting for the B. F. Goodrich Co. Industrial Products Division.

CLEMENS A. SEILS has been promoted to office manager of the Adhesives and Coatings Division, Minnesota Mining & Manufacturing Co.

H. I. GIBSON, formerly a member of the staff of the executive vice-president of the Firestone Tire & Rubber Co., has been named manager of the Corporal Guided Missile Division of the company.

HORACE C. BRUNNER, associated with the Wyandotte Chemicals Corp. since 1930, has been named manager of the Chicago office of the Michigan Alkali Division.

EDWIN D. MEADE, who joined the U. S. Rubber Co. in 1930, has been named manager of industrial products sales for the Mechanical Goods Division of the U. S. Rubber Co.

J. W. URBAN, associated with Monsanto Chemicals, Ltd., London, England, since 1929, has been appointed a director of the company. He is presently director of overseas relations.

JOHN R. PFANN, formerly a sales assistant at Sharples Chemicals Inc., has been appointed sales analyst succeeding J. W. CONYERS, JR., who has been transferred to the Market Development Department.

P. W. PERDRIAU, associated with the B. F. Goodrich Co. since 1934, has been appointed director of employee relations for the B. F. Goodrich Co. Tire and Equipment Division.

J. E. TRAINER, executive vice-president and a director of the Firestone Tire & Rubber Co., has been named a life member of the American Society of Mechanical Engineers.

JOSEPH S. DETWILER has been appointed export manager of the Taylor Instrument Companies, Rochester, N. Y., succeeding JOHN H. NEUBERT, who established the department forty years ago and served continuously as its manager ever since.

ORRIN K. FEIKERT has been named manager of the Truck Tire Sales Department of the Seiberling Rubber Co., while FRANK G. HAGER has been named assistant manager of the department.

ALLAN E. SHORE, previously associated with the Amerotron Corp., has been elected vice-president in charge of automotive, government and industrial fabrics of Sidney Blumenthal & Co., Inc.

CHARLES GARDNER, who has been associated with the paint industry for eighteen years as chemist and plant manager, has been appointed sales manager of the Drier Division, Witco Chemical Co.

V. L. PEICKII has been appointed director of research of the National Motor Bearing Co. He will be located at the company's Redwood City, Calif., home office and plant, and will be in charge of product research engineering and development.

RALPH K. GUINZBURG, president of the I. B. Kleinert Rubber Co., has been re-elected chairman of the New York City United Service Organizations Committee.

JAMES W. CARKNER, chairman of the board of the Pepsi-Cola Co., has been elected a director of Lea Fabrics, Inc.

W. C. DAVIS, previously associated with the Monsanto Chemical Co., has been appointed Detroit district manager for the Pennsylvania Industrial Chemical Corp.

FRANK W. MILWARD has been appointed special representative in the Chicago territory of the Chemical Division, Goodyear Tire & Rubber Co. He will service mainly the plastics industry and will assist in sales and applications of high impact resistant molding resins and special vinyl resins.

CORTES E. HICKS, formerly associated with the U. S. Wire & Cable Corp., has joined the Rubber and Plastics Color Division of Sinclair & Valentine Co. Mr. Hicks will serve as superintendent of the Ridgway, Penna., plant.

Appoints Three Factory Managers

U. S. Rubber Co., New York, N. Y., has announced the appointment of three new factory managers. Edward A. Martin has been named factory manager of the Chicago, Ill., plant, while Raymond A. Herrly has been named to a similar post at Mishawaka, Ind., and Charles H. Baldwin has been named to the same position at Santa Ana, Calif. Mr. Martin is a graduate of Rose Polytechnic Institute and started with U. S. Rubber in 1947. In 1953, he was appointed manager of industrial engineering at the Chicago plant, the position he held at the time of his promotion to factory manager. Mr. Herrly had been plant manager of the company's new foam rubber plant at Santa Ana since May, 1953. A graduate of Notre Dame University, he began his career with U. S. Rubber in 1939. Mr. Baldwin, newly-appointed factory manager at Santa Ana, had been connected with the Mishawaka plant since 1933. In September, 1951, he became factory manager at Mishawawa, the position he held at the time of his new assignment.

Brandt Joins Bond International

A. R. Brandt

A. R. Brandt has joined Bond International, Inc., as vice-president in charge of manufacturing and as a member of the board of directors. Mr. Brandt was previously associated with the Schacht Rubber Manufacturing Co. of Huntington, Ind., for approximately sixteen years, as general manager. Most recently, he was associated with the Asbestos Manufacturing Co., an affiliate of the Thermoid Co., in the position of executive vice-president. In this capacity, he was completely responsible for the operation of the Asbestos Manufacturing Co. Mr. Brandt's responsibilities with Bond International will cover all phases of manufacturing, chemistry, and the technical development of several proprietary items.

Quaker Rubber Appoints Murken

Walter Murken has been appointed production manager of the Quaker Rubber Corp., division of the H. K. Porter Co., Philadelphia, Penna. At the same time, W. H. Pender was named manager of belting sales, while W. H. Heath was named manager of lawn hose sales. Joseph Cleary has been named plant engineer. In his new position, Mr. Murken will be responsible for the planning and scheduling of all plant production facilities. Mr. Murken studied business administration at the University of Pennsylvania, and has served Quaker Rubber in various capacities over the past 16 years. Previous to his latest appointment, he was district sales manager for the Philadelphia area.

Barrett Division Names Three

Barrett Division of the Allied Chemical & Dye Corp., New York, N. Y., has announced that Julian S. Pruitt has been assigned to the Detroit territory, replacing E. J. McMullen, who has resigned. Evan E. Senuk has been transferred to the Southern New Jersey territory, succeeding Mr. Pruitt. Lorne C. Stocker, who recently joined Barrett's Sales Department, has been assigned to the Mid-Atlantic territory, replacing Mr. Senuk. Mr. Pruitt has been with Barrett for two and one-half years, while Mr. Senuk joined the concern in 1937.

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QM Adopts New Testing Procedure

Adoption of a new inspection testing procedure for supplies purchased by the Army Quartermaster Corps in order to expedite procurements of commercial type items was recently announced. Under the new procedure, the Quartermaster Corps will no longer require that acceptance testing be made by the Quartermaster General Testing Laboratory in Philadelphia, Penna., but will require inspection testing to be arranged by contractors. Such inspections may be made by company owned facilities or by commercially operated facilities. When inspection testing is made by facilities other than the Quartermaster Testing Laboratory, the contractors will submit certificates of compliance, supported by test results as required in the applicable specifications. The government's role will be limited to check-testing on a sample basis. As soon as detailed operating procedures are completed by the Quartermaster Inspection Service Command and test requirements are furnished to the appropriate Quartermaster Central Purchasing Office for specific items, requirements under the new procedure will be set forth in the Invitation to Bid, Request for Proposals, or Notices of Intent to Purchase covering the particular items.

More Data on Omya BSH

In the June, 1954, issue of RUBBER AGE, there appeared an item on "Omya BSH", a new natural, surface treated calcium carbonate said to be made from the very soft and pure whiting found in the Champagne district of France, and which may be secured in the United States from Pluess-Staufer (North American), Inc., 82 Beaver St., New York 5, N. Y. It should be emphasized that the cryptocrystalline character of this chalk is responsible for its very fine structure. Omya BSH is not a reinforcing filler, but is said to facilitate the incorporation of such pigments in rubber compounds. Made by a patented process, each individual particle comes into direct contact with the coating agent in which it is incorporated, thus providing for good dispersion and easy processing. The product is also reported to give a plasticizing effect.

Webb Elected Assistant Secretary

The board of directors of the Lee Rubber & Tire Corp., at a meeting held in New York City on September 29th, elected John B. Webb as assistant secretary of the corporation. Mr. Webb, who was born in Nova Scotia, Canada, joined Lee Rubber in 1934, immediately following graduation from St. Matthew's High School in Conshohocken. In 1936 he was appointed secretary to the president of the corporation and held this position until he entered the Army in 1943. He served with the Army in the China-Burma-India Theatre until 1946 when he rejoined Lee Rubber as a member of its purchasing department. In 1952 he was appointed assistant purchasing agent. Mr. Webb is a graduate of the University of Pennsylvania Evening School of Accounts and Finance.

Spend Vacation in Hawaii

Pictured on the terrace of the Halekulani Hotel, Waikiki Beach, during their recent vacation in Hawaii, are Mr. and

Mrs. Ernest G. Brown. Mr. Brown is vice-president and general manager in charge of the Mechanical Goods Division of the U. S. Rubber Co.

Elected Permacel President

G. C. Riegger has been elected president of the Permacel Tape Corp. of New Brunswick, N. J., succeeding G. O. Lienhard, who has been named chairman of the board. Mr. Lienhard is also chairman of the Chicopee Manufacturing Corp., and is a director and member of the Executive Committee of Johnson & Johnson. Both Permacel and Chicopee are subsidiaries of Johnson and Johnson. Mr. Riegger relinquishes the posts of executive vice-president and treasurer of Chicopee, which company he joined in 1934 as an accountant.

Bids for Wilson Rubber

Wilson Rubber Co., Canton, Ohio, has announced that Becton Dickinson & Co. of Rutherford, N. J., has offered to buy the company. The New Jersey company has entered into a preliminary purchase contract with holders of about one-fourth of the Wilson stock. Dickinson wants all the Wilson stock, Wendell Herbruck, president of Wilson, said, but the contract will be binding if two-thirds of the stock is in Dickinson control by December 27. Mr. Herbruck did not make public the sale price. Wilson manufactures rubber gloves and surgical tubing.

Carbon Dispersions Names Lukens

Carbon Dispersions, Inc., Newark, N. J., has announced the appointment of the Lukens Chemical Co. of Newton, Mass., as district sales representative for New England. Dr. Alan R. Lukens, the senior partner of the Lukens company, is well-known to the trade for his research work in the pigment field. Donald N. Lukens, his son, is especially acquainted with the application of pigment dispersions in the rubber and plastic field. Lukens Chemical Co. maintains a well-equipped laboratory on their premises in Newton.

Spadone Machine Moves Offices

Spadone Machine Co., formerly located in New York City, has moved its offices to Connecticut Ave., South Norwalk, Conn. A modern, one-story, 4,000-square-foot building at the new location provides additional space needed for offices and the demonstration of machines. The company also plans to carry on special design and experimental work in the new quarters. Well-known to the industry for the manufacture of vertical bias cutters, spring leaf trucks, crude rubber bale cutters, lining strippers and press cleaning machines, the Spadone company is also closely affiliated with and representatives for the Alfa Machine Co. of Milwaukee, Wisc. This company manufactures a wide line of automatic cutting and stacking machines, several of which have been specially designed to meet the requirements common to the rubber and plastics industries. In 1952, the two interests purchased the Metaline Oilless Bearing Division from the R. W. Rhoades Metaline Co., and formed the Spadone-Alfa Corp. for the manufacture and sale of Metaline Oilless Bearings and products. The main offices of this latter company have also been moved to the South Norwalk address.

Appointed Factory Superintendent

Promotion of Arthur B. Warner from assistant plant manager to factory superintendent at the main plant of Minnesota Rubber and Gasket Co., Minneapolis, Minn. has been announced. Mr. Warner will be in charge of all manufacturing operations for the company, which is said to be the nation's largest producer of O-rings and originators of the modern rubber injection molding process and the new four-lipped Quad-ring seal. He has been with Minnesota Rubber for two years in his former position. The promotion was effective as of October 1. Before joining Minnesota Rubber, Mr. Warner had his own floor tile business in Hopkins, Minn. He attended the University of Minnesota and was a Navy pilot for three years, winning the Distinguished Flying Cross and four air medals.

To Grow Rubber in Liberia

B. F. Goodrich Co. and the Government of Liberia have signed an agreement granting the company an 80-year concession to plant, operate and grow rubber in Liberia. Two separate areas are involved in the concession. With the conclusion of the agreement, Goodrich will become a rubber grower on a commercial scale for the first time. At one time, the company had experimental plantings in Central America. Goodrich will become the fourth of the major rubber manufacturers to engage in plantation operations and the second in Liberia. Firestone Tire & Rubber Co. has been engaged in growing operations in Liberia since the early 1920's.

A new catalog in color, covering its line of industrial fire hose and fittings, has been announced by the Boston Woven Hose & Rubber Co., Boston, Mass.

Glass-Filled Silicone Compound

A new glass-filled silicone compound for molding high temperature plastic parts has been developed by Dow Corning Corp., Midland, Mich. Identified as "Dow Corning 301 Molding Compound," it produces parts which may be pulled hot without cooling the mold. After-baking is unnecessary except where parts are to carry a load at high temperatures. Properly molded parts will withstand continuous exposure to 450°F., plus intermittent exposure to as high as 700°F., the company states. Typical properties after molding 10 minutes at 340°F. include a tensile strength of 5,000 to 7,000 psi, a compressive strength of 10,000 to 12,000 psi, and an impact strength of 15 to 22 foot-pounds per inch. Flexural strength ranges from 12,000 to 14,000 psi at room temperature and 5,000 psi at 392°F. It is said that Dow Corning 301 may be molded with conventional equipment by either compression or transfer techniques. Mold shrinkage ranges from zero to 0.0035%. Finished parts may be machined with high speed tools. These properties suggest the use of Dow Corning 301 to mold a wide variety of high temperature structural or dielectric parts for aircraft, electrical and electronic applications.

New Organic Color Lakes

Exceptional lightfastness and brilliance characterize the new series of organic color lakes recently introduced by Harmon Colors of the B. F. Goodrich Chemical Co., the company states. The new color lakes, marketed as "Harmon Indo Colors", are certain vat colors which are noted for their durability and stability under severe weathering conditions. Harmon Indo Colors are said to exhibit remarkable stability even in the very light shades, in which the pigments are reduced fifty-to-one with titanium dioxide. The new group of colors include a yellow, orange, red, scarlet, maroon, brown, green, blue, and a violet outstanding in brilliance and tintorial strength.

Rubber Road Test Project

A four-lane strip of rubberized asphaltic concrete is now being laid in Norman, Okla., at the approach to the South Canadian River Bridge. The four-mile stretch will cost $335,000 and will have asphaltic concrete combined with a latex furnished by the Firestone Tire & Rubber Co. laid in equal mileage with regular asphaltic concrete in order to test comparative wearabilities. It is expected that the four-mile stretch will be completed by February.

Moves Two Departments

Effective October 11, 1954, the Purchasing and Advertising Departments of the B. F. Goodrich Sponge Products Division of the B. F. Goodrich Co., moved from the former location on Howe Avenue, Shelton, Conn., where they have been located for many years, to Plant "D" located at 6 Bridge Street, Shelton. Parking facilities have been made available in the rear of the building for visitors.

Hensal Appointed Superintendent

Earl Hensal

Earl Hensal has been appointed superintendent of the Akron tire plant of the B. F. Goodrich Co. Tire and Equipment Division. Mr. Hensal has been with the company since 1933 when he joined the firm as a factory employee. He continued his education at the University of Akron until 1936, majoring in economics. In 1939, Mr. Hensal was transferred to the company's Oaks, Penna., tire manufacturing plant as manager of the Factory Standards Department and in 1943 he was sent to the Los Angeles plant as general foreman. In February, 1950, he became superintendent of tire production at the Kitchener, Ont., plant of the B. F. Goodrich Rubber Co. of Canada, Ltd., a position he retained until November, 1950, when he returned to Akron as production superintendent of tire manufacturing.

Foam Rubber Calibration Chart

Pacific Transducer Corp., Los Angeles, Calif., has made available a new circular and calibration chart which shows conversions for latex foam rubbers, sponge rubbers and rubberlike plastic sponge for the various scales of the American Society for Testing Materials, Rubber Manufacturers Association, Scott and Shore A scales and the Pandux scale. This is said to be the first time that these various scales have been correlated so that one can convert any one scale to another at a glance. Copies of the chart are available from the company at 11836 West Pico Blvd., Los Angeles 64.

Heads Roll Covering Department

R. R. Meltz has been named manager of the Roll Covering Department of the Quaker Rubber Corp., a division of the H. K. Porter Co., Inc., Philadelphia, Penna. A graduate of Temple University, Mr. Meltz joins Quaker Rubber with a background of fourteen years in the rubber industry. In his new position with Quaker Rubber, he will coordinate the activities of factory and field personnel in the sales and service of Quaker roll covering, which includes all re-covering and re-grinding of rubber covered rolls, as well as covering new rolls.

Polyoid Joint Filler

Grems Manufacturing Co., Klamath Falls, Ore., is now marketing "Polyoid Rubber Joint Filler," a thermoplastic hot poured type of joint filler with improved resistance to jet fuels, gasoline, oils and greases. The company states that Polyoid Filler flows more easily at hot melt pouring temperatures, filling completely into joints and seams. It will effectively seal against infiltration of moisture, and will not flow from the joint or adhere to vehicle tires. Highly elastic, the material is resilient and has high adhesion. It will not char, coke, or form lumps if overheated, the company states. The product complies with Interim Federal Specification SSS-00167 (GSA-FSS) September 25, 1952, for Sealer, Hot Poured, Jet Fuel Resistant Type (For Joints in Concrete). The product is also made in a cold pouring form, for more convenient use.

Conducts Quality Control Seminar

William F. Buhl, senior procedure analyst for the B. F. Goodrich Co., Akron, Ohio, conducted a three-day seminar on the application of statistical quality control to clerical and accounting procedures at the ninth annual convention of the Systems and Procedures Association in New York City, October 25 to 27. Mr. Buhl lectured on the principles of statistical quality control and its application to office operations. Typical applications were shown and the benefits to be obtained from such a program were outlined. Audience participation tests demonstrated that it is possible by sampling to approximate the amount of error in any given lot of clerical work and, by identifying work lots containing error, it is necessary only to check such lots.

Now Producing Alamask BD

Rhodia, Inc., New York, N. Y., has announced the re-establishment of "Alamask" BD for the reodorization of neoprene latex, alone and in combination with Alamask ND. Alamask BD was withdrawn from the market by E. I. du Pont de Nemours & Co. prior to the transfer of DuPont's reodorant business to Rhodia. Improved manufacturing facilities have made it possible to again supply this product to the rubber industry. Formula recommendations are available from the Engineering Section of Rhodia.

Constructing Arkansas Plant

American Hard Rubber Co., New York, N. Y., has announced plans to establish a $1,500,000 factory at Booneville, Ark., in a 43,000-square foot building to be constructed on a 29-acre site at a cost of $265,000. The plant will be leased to the company by the South Logan County Industrial Foundation on a rental basis which will amortize the cost in 15 years. The plant will employ 200 persons, about two-thirds of them men, when the firm's comb-making plant is moved from Butler, N. J., to Arkansas, the company said.

Fulkert Announces Retirement

Charles L. Fulkert

Charles L. Fulkert, vice-president of the Stokes Molded Products Division of the Electric Storage Battery Co., retired on October 30. A native and lifelong resident of Trenton, Mr. Fulkert was born on October 14, 1884. He attended Stewart Business College in Trenton where he was trained in bookkeeping and shorthand. His first job was with Joseph Ashton, Jr., predecessor company of the present day Wiley-Hughes Supply Co. He also spent a short time with the Munger Tire Co. In December, 1902, Mr. Fulkert joined the Joseph Stokes Rubber Co., and in 1903 was appointed factory superintendent. He served in that capacity for 34 years. During this period he had a hand in the growth of the company which at one time employed 1,100 persons. He was instrumental in its conversion from the manufacture of bicycle tires and rubber hoses to telephone parts, storage battery containers, and battery plate separators. In 1938, Mr. Fulkert was promoted to vice-president and moved into the Sales Department. He was retained in that capacity when the concern was purchased by the Thermoid Co. in 1943. Mr. Fulkert played an important part in arranging the sale by Thermoid to Electric Storage Battery in 1946. Since that time, he has been a vice-president and a director of the latter firm. In 1952, on the eve of his 50th anniversary in the rubber industry, Mr. Fulkert was tendered a testimonial dinner by the board of directors of Stokes Molded Products. "Uncle Charlie," as he is affectionately known, has been a Mason for 48 years. Mr. Fulkert's plans for the future are not completely formed as yet, but it is certain he will continue to be active in community affairs.

Minnesota Mining Promotes Houdek

Minnesota Mining and Manufacturing Co., St. Paul, Minn., has announced the appointment of Lawrence C. Houdek as division engineer of the Adhesives and Coatings Division. Mr. Houdek joined Minnesota Mining in 1941 in the abrasives laboratory, later becoming a field engineer. For the past two years, he has been assistant division engineer for the Central Manufacturing and Color and Sulfuric Acid Division.

Two New G-E Silicone Gums

The Silicone Products Department of the General Electric Co., Waterford, N. Y., has announced the development of two new silicone rubber gums for the manufacture of silicone rubber compounds with strength said to double that of other silicone rubbers. Designated "G-E 81465" and "G-E 81477," the developmental polymers were designed to be combined with a new filler, "Fine Silica Technical," developed by E. I. du Pont de Nemours & Co. The G-E gums can be used in combination with DuPont silica to obtain maximum reinforcement. G-E engineers state that in combination with this filler, the gums may be used to produce silicone rubber compounds with approximately double the tensile strength—nearly 1,600 pounds per square inch—and more than twice the tear strength—from 200 to 300 pounds per inch—of materials so far developed. They are also said to have 50% higher elongation. G-E 81465 is a gum with normal shrinkage and flexibility at —65°F., while G-E 81477 has lower shrinkage and retains flexibility below —100°F. The latter is especially adapted to the needs of the aircraft industry.

New Naugatuck Publications

Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., has made available two interesting publications. The first of these, entitled "There is No Better Source for Latex," offers a breakdown of the various types of latices offered by the company. The other publication is a rubber map of the world showing principal producing areas for both natural and synthetic rubber. Additional statistical information shows U. S. consumption of natural and synthetic rubber for 1953 with an estimated breakdown by product.

LABOR NOTES

Local 5 of the United Rubber Workers, C.I.O., has voted approval to a new contract with the B. F. Goodrich Co., and it was expected that eight other Goodrich plants across the country would also vote approval. Wages were not a factor in the new master contract which runs until April, 1957. A general wage increase was negotiated earlier this year. The new contract liberalizes such clauses as job protection, vacations, grievance procedures, special pay rates, holiday pay, protection of those hurt, sick or laid off their jobs, and others. Either the company or the union can open negotiations on a general wage change by submitting written notice of 60 days.

A new 6½c an hour "package" agreement has been ratified by Local 9 of the United Rubber Workers, C.I.O., at the General Tire & Rubber Co. in Akron. The agreement calls for a 6c across-the-board raise and use of the other ½c to adjust intra-plant wage rates on certain jobs. Previously, the General Tire local at Waco, Texas, had voted to accept the 6½c.

U. S. Rubber Promotes Bushnell

Lester P. Bushnell

Lester P. Bushnell has been named assistant production manager of the Footwear and General Products Division of the U. S. Rubber Co., effective November 1. Mr. Bushnell, a graduate of the University of Michigan, began his career with the company in 1929, starting as a time study engineer in Chicago. From 1930 to 1943, he served in the footwear plant in Naugatuck, as industrial engineer, assistant superintendent of canvas footwear production, superintendent of waterproof footwear production and as production superintendent. In 1943, Mr. Bushnell was transferred to the Mishawaka, Ind., plant as general superintendent of manufacturing. He was appointed factory manager of the Chicago plant in September, 1951, the post he held at the time of his most recent promotion.

Opens New Distribution Center

B. F. Goodrich Co., Akron, Ohio, is now distributing its tires, rubber conveyor belts, industrial hose and other rubber and plastic products in New England and eastern New York from a new distribution center recently completed at West Springfield, Mass. The one-story brick and steel building is located on a four-acre tract and has 70,000 square feet of floor space. The company's line of auto and home supplies, including batteries, spark plugs, freezers and bicycles, are also warehoused in the new building.

Tubeless Tires for Light Trucks

Tubeless tires are being shipped to major manufacturers of light trucks by the Firestone Tire & Rubber Co. for installation as standard equipment on new 1955 models. Firestone states that the development of satisfactory tubeless truck tires was first announced by the company early in 1953. Since that time, commercial and company test fleets of trucks have driven several million miles with statistical results showing that the frequency of road delays is reduced more than 72% with the new tubeless tire.

Silent Traction Winter Tire

A recently-developed winter traction tire, said to offer several major improvements in winter tire design, is now being manufactured by Dunlop Tire and Rubber Corp., Buffalo, N. Y. Tested under actual road service at selected national locations last winter, the new Dunlop tire, identified by the maker as the "Silent Traction," was found to have extraordinary traction and non-skid properties on ice, snow, as well as on dry pavements. Much of this skid resistance can be attributed to the unusual tread pattern, whose center section consists of a series of closely spaced chevron-shaped buttons. These buttons have more than 2600 gripping edges relative to forward and backward motion for maximum gripping and stopping action, and more than 1900 laterally oriented edges to resist side skids. In contrast, one major brand of traction tire offers about 500 forward and backward edges, and 1000 lateral edges. Another bugaboo of winter tires—excessive road whine—appears to have been practically eliminated. At normal road speeds tire noise is at an unusually low level, and is difficult to distinguish from the road noise of a standard tire. Four tire sizes are available, all for a 15-inch rim 6.70, 7.10, 7.60 and 8.00. White sidewalls are offered optionally in each size.

Minerals & Chemicals ASP 1200

Minerals & Chemicals Corp. of America, Metuchen, N. J., a new corporation which recently brought together Edgar Brothers Co. of Metuchen and the Attapulgus Minerals & Chemicals Corp. of Philadelphia, Penna., has introduced a new product in the line of Edgar aluminum silicate pigments. Known as "ASP 1200", the new product is said to result from the perfection of an economical and improved spray drying process by Minerals & Chemicals. ASP 1200 is a water-washed, water-fractionated, fine particle size, predispersed aluminum silicate pigment. The new spray drying process is covered by U. S. patent number 2,540,182, and Minerals & Chemicals is licensing other concerns to use this process. ASP 1200 is said to have a wide range of applications in the manufacture of rubber, plastics, paints, adhesives, etc. It is guaranteed less than 1% moisture and is 99.9997% pure, the company declares. It is free flowing and has an extremely high bulk density for easy handling and storage.

Acquires Interest in Heintz

Akron Standard Mold Co., Akron, Ohio, has acquired a financial interest in the James C. Heintz Co. of Cleveland, Ohio, manufacturers of retreading equipment and aluminum tire mold inserts. The Heintz concern will operate as heretofore without any change in management or policies. It will, however, be able to use the facilities of Akron Standard Mold and the Lectromelt Casting Division. Akron Standard Mold is now in a position to furnish complete tire molds with precision cast matrices or inserts by using the Heintz "Monotread" method of casting.

U.S. Rubber Promotes Lovell

G. Allen Lovell

G. Allen Lovell has been appointed assistant general manager of the Mechanical Goods Division of the U. S. Rubber Co., succeeding Herbert G. Kieswetter, who has been named executive assistant to the general manager of the company's International Division. Mr. Lovell will have responsibility for supervising production and research as well as sales operations in the Mechanical Goods Division. He was formerly sales manager of manufacturers' products in the Footwear and General Products Division. He will make his headquarters in New York City. Born in Williamsport, Penna., Mr. Lovell joined U. S. Rubber in 1918 as an apprentice in the Williamsport plant. He won steady promotions until he became manager of production control in 1932. Later that same year, he transferred to the company's plant in Mishawaka, Ind. In 1936, Mr. Lovell joined the company's Sales Department and in 1938 became manager of coated fabrics sales. In 1944, he was appointed sales manager of "Koylon" foam rubber. Mr. Lovell became sales manager of all manufacturers' products in 1949. Mr. Kieswetter will supervise activities of the International Division in Great Britain and Europe, including relations with affiliated and associated companies and with sales organizations and customers of the division in that area.

Compo and Vik Sign Agreement

Compo Shoe Machinery Corp., Boston, Mass., and Vik Supplies, Ltd., Stafford, Eng., a subsidiary of Lotus, Ltd., signed an agreement under which Vik will manufacture Compo shoe adhesives and machines in England for distribution in the British Isles and Compo will manufacture Vik shoe adhesives and machines for distribution in the U. S. Compo is the second largest maker of shoe machinery and the leading producer of sole-attaching adhesives in the U. S. Vik has an extensive shoe adhesive and machinery business in England.

Major advances in the low cost, nonwoven fabric field have been announced by the Leshner Corp., Hamilton, Ohio, with the introduction of a non-woven cheesecloth wiper, called "Wip-Eez".

King Develops Mold Process

H. A. King Co., West Fort St. at 10th St., Detroit 16, Mich., has developed a new mold process which it believes is of considerable interest in the manufacture of molded rubber parts. The process is also of interest to automobile, truck and bus manufacturers, in that the finish on molded rubber parts can be controlled insofar as luster is concerned without the use of costly hard chrome plating of mold cavities. The patented process is basically a plate coating whereby the coating is applied to the surface of a mold at approximately 250 milligrams per square foot. This is accomplished by an immersion type bath using a patented material and employing exacting standards and time process. While many bath types are commercially available, the company states, this bath differs as it is a non-crystalline bath and results in an amorphous type film. Molds treated in this way can be steam cleaned, do not rust, will cut down rejects, and will provide substantial savings in production time in that molds do not have to be cleaned as often as heretofore. This process is being offered to industry on a license-royalty basis. Further information can be secured from the company.

Chemically Improved Cotton

What is said to be the first pilot plant for the cyanoethylation of cotton was officially opened on October 5 at Rossville, Ga. The pilot plant, located at the National Plant of the Standard-Coosa-Thatcher Co., is the result of intensive work by the Institute of Textile Technology and the American Cyanamid Co. on equipment design and process development for the chemical modification of cotton. Cyanoethylation is a process in which cotton is modified by reaction with acrylonitrile. The Institute will operate the pilot plant treating cotton yarns and fibers supplied by its member mills into various end-use products. It will also aid in market evaluation. Laboratory tests indicate that the treated cotton shows improved rot and heat resistance, abrasion and chemical resistance, dye receptivity, electrical insulation as well as yarn and fabric strength.

3M Building Alabama Plant

Minnesota Mining & Manufacturing Co., St. Paul, Minn., has announced plans to build a plant at Guin, Ala., to expand its production of reflective products. The cost was put at $2,000,000 or over. The plant will produce "Scotchlite" and "Centerlite," tape-like reflector materials sold by Minnesota Mining for use on motor vehicles and in other applications. These materials currently are being produced at plants in Hastings and St. Paul. H. P. Buetow, president, said the decision to build in Alabama was prompted by the state's tax laws, which provide 10-year exemptions on personal property and real estate for new plants. Guin Township, which is about 80 miles northwest of Birmingham, will provide the plant site and furnish rail and utility facilities at no cost to Minnesota Mining.

Elected Sales Vice-President

Clark H. Johnson

Clark H. Johnson, formerly manager of machinery sales for the United Engineering & Foundry Co., Pittsburgh, Penna., has been elected vice-president in charge of sales succeeding William Hagel, who has been appointed vice-president and executive assistant. Mr. Johnson is a graduate of Carnegie Institute of Technology and since joining United Engineering in 1930 has successively held the positions of draftsman, assistant manager of the Gear Department, manager of the Gear Department, assistant superintendent of the New Castle plant, superintendent of the New Castle plant, foreign representative with headquarters in London, and manager of machinery sales. Mr. Hagel is also a graduate of Carnegie Institute and joined the company in 1917. He was elected vice-president in charge of sales in 1946. Mr. Hagel also serves as vice-president, director and member of the Executive Committee of the Adamson United Co., a wholly-owned subsidiary of United Engineering.

Announces Super Tire Yarn

A rayon tire yarn of super strength and improved fatigue characteristics is now in commercial production at the Front Royal, Va., plant of the American Viscose Corp. The new yarn, which will be identified by the trade mark name "Super Rayflex" will ultimately replace the improved type yarn currently manufactured. Super Rayflex is currently available in 1650 denier. Within a year it is expected that all production facilities of the corporation's plants at Front Royal, Va., and Lewistown, Penna., currently assigned to tire yarn spinning, will be converted to the new yarn.

Dr. Simmons Recovering

Dr. Hezzleton E. Simmons, president emeritus of the University of Akron, is recovering at home from a heart attack he suffered on September 16. Dr. Simmons, 68, is up for an hour or two a day but has not been able to receive visitors. For weeks after the attack, Dr. Simmons was hospitalized and carried on the critical or serious lists.

Court Upholds Goodyear Claim

A recent decision by the common pleas court of Franklin County (Columbus, Ohio) has upheld the claim of the Goodyear Tire & Rubber Co. that the Ohio Industrial Relations Department overstepped its authority in ordering the company to make extensive mechanical alterations at the synthetic rubber plant on Archwood Avenue in Akron, Ohio, which the company operates for the Federal Government. The court ruled in favor of the company on all twelve points listed in the order. The changes, which dealt largely with safety devices, would have cost the government approximately $1,000,000. The court decision definitely establishes the plant as a safe place to work, agreeing with the views held by Federal inspectors. State inspectors had taken an opposite view. Primarily, the dispute revolved around the storing, handling and utilization of liquified petroleum gases in addition to ventilation and gas detection. The dispute goes back to June, 1951, when a work stoppage occurred at the plant. Certain employees refused to accept additional duties which would have utilized idle time, claiming this violated safety regulations. While the case has been in court, the plant has received citations for outstanding achievement in the safety field, the company states.

To Manufacture Diisocyanates

National Aniline Division, Allied Chemical & Dye Corp., New York, N. Y., has started construction of facilities for the production of diisocyanates in introductory commercial quantities at its Buffalo, N. Y., plant. The new installation is expected to be on stream during the first quarter of 1955. All raw materials needed for the production of diisocyanates will be provided by various divisions of Allied Chemical. Diisocyanates for the production of polyurethane rubber, foams, films and adhesives will be manufactured. Products to be produced will include 2,4-tolylene diisocyanate, various mixtures of isomeric tolylene diisocyanates (TDI), 3,3′ bitolylene, 4,4′ diisocyanate (TODI) and p,p′ diphenylmethane diisocyanate (MDI). Experimental quantities of these materials will be made available shortly from smaller semi-plant facilities also located in Buffalo.

"New latex my foot . . . I know bourbon when I smell it!"

Witco Chemical Promotes Minnig

Max Minnig

Witco Chemical Co., New York, N. Y., has announced the election of Max Minnig as executive vice-president. Mr. Minnig joined Witco's Natural Gas Division in 1946, and served successively as national sales manager for rubber chemicals, director of sales and vice-president. Mr. Minnig is a graduate of the University of Oklahoma.

Forms Rubber Repair Business

M. T. Pierce, 4932 Lantana Drive, San Diego, Calif., has formed a business for the repair of industrial and consumer rubber articles. With a background in the rubber industry dating back almost twenty years, Mr. Pierce has had extensive experience in the repair of rubber products used by the Armed Forces, such as fuel cells, life rafts, wading suits, cockpit seals, gloves, apron, hose. He has also had experience in the installation of new rubber tank liners and has developed a method of bonding rubber to micarta. Mr. Pierce has also done extensive work on the repair and maintenance of rubber goods and sporting equipment used in the public school system. In line with his new endeavor, Mr. Pierce is interested in hearing from either companies or individuals who have rubber repair or maintenance problems.

George Joins Witco Chemical

W. F. George, until recently district sales manager for the Hooker Electrochemical Co., has joined the Witco Chemical Co. as special assistant to the president. Well-known in the chemical industry with which he has long been associated, he organized and conducted W. F. George Chemicals, Inc., for several years and later was co-publisher of "Chemical Industries," now known as "Chemical Week." Mr. George is a charter and life member of the Salesmen's Association of the American Chemical Industry and a Past President of the Chemists' Club, of which he is still a Trustee.

FINANCIAL NEWS

Goodyear Tire and Rubber Co.

Nine Months to September 30: Net income of $31,798,688, which is equal to $6.53 a common share, compared with $35,321,461, or $7.30 a common share, for the same period of 1953. Earnings for both periods are based on 4,550,756 common shares outstanding. Net sales for the period totaled $789,177,842, a drop of 14.2% below the $920,310,190 reported for the same period of the preceding year. The net income for the first nine months of this year is 10% below that achieved in the corresponding period of 1953. The company reports that the drop in sales reflects the seven-week strike which halted operations from July 8 to the end of August.

Diamond Alkali Co.

Nine Months to September 30: Net income of $4,328,882, which, after preferred dividends, is equal to $1.74 a common share, compared with $4,414,340, or $1.77 a common share, in the first nine months of 1953. Net sales for the first nine months of 1954 amounted to $70,988,638, compared with $65,507,099 in the same period of the preceding year. Net sales for the period set a record high for any similar nine month period in the company's 44-year history. The decline in net income for the period is due, the company states, to increased provisions for Federal income taxes, depreciation and amortization.

Olin Mathieson Chemical Corp.

Nine Months to September 30: Net profit of $24,521,554, which is equal to $2.17 a common share, after a 5% stock dividend, compared with $24,983,833, or $2.31 a common share, for the first nine months of 1953. Net sales of the company in the nine month period amounted to $355,215,354, compared with $357,979,786 in the 1953 period. Olin Mathieson Chemical Corp. was formed on August 31, 1954, by the merger of Olin Industries, Inc., and Mathieson Chemical Corp. The above report, therefore, includes one month of combined operations.

Flintkote Company

Forty Weeks to October 9: Net income of $3,822,208, which is equal to $2.83 a common share, compared with $3,943,294, or $2.93 a common share, in the same period of the preceding year. This report covers the company and its subsidiaries.

General Cable Corp.

Nine Months to September 30: Net income of $3,562,925, which is equal to $1.58 a common share, compared with $3,906,231, or $1.76 a common share, in the same period of the preceding year.

U. S. Rubber Co.

Nine Months to September 30: Net profit of $20,084,571, which is equal to $3.05 a common share, compared with $21,488,326, or $3.32 a common share, in the same period last year. Net sales amounted to $587,269,614, compared with $657,393,028 in 1953. Net profit for the first three quarters was down 6% on 11% lower sales. Provision for federal and foreign income taxes and renegotiation of defense business for the period was $22,819,858, compared with $45,686,913 last year.

American Cyanamid Co.

Nine Months to September 30: Net income of $18,960,630, after preferred dividends, which is equal to $2.17 a common share, compared with $22,443,438, or $2.60 a common share, in the first nine months of 1953. Net sales for the period amounted to $293,326,188, compared with $287,301,694 in 1953. This report covers the company and its subsidiaries.

Sheller Manufacturing Corp.

Nine Months to September 30: Net profit of $2,058,630, which is equal to $2.16 a share, compared with $2,702,810, or $2.83 a share, in the same period of the preceding year. Net sales for the 1954 period amounted to $26,349,468, compared with $36,983,136 in the first nine months of 1953.

National Automotive Fibres, Inc.

Nine Months to September 30: Net loss of $326,141, compared with a net income of $2,599,402, or $2.61 a share, in the comparable period of the preceding year. Net sales for the 1954 period amounted to $41,612,031, compared with $68,840,899 in the first nine months of 1953. This report covers the activities of the company and its subsidiary.

General Tire & Rubber Co.

Nine Months to August 31: Net profit of $4,427,452, compared with $5,505,856 in the same period of the preceding year. Net sales for the nine months amounted to $154,962,719, compared with $150,851,345 for the nine months ended August 31, 1953. This report covers the company and its subsidiaries.

Mt. Vernon-Woodbury Mills, Inc.

Nine Months to September 30: Net profit of $388,673, which is equal to 60c a common share, compared with $1,161,896, or $1.80 a common share, in the same period of the preceding year. Net sales for the nine months amounted to $24,253,457, compared with $29,031,678 in the 1953 period.

Aetna-Standard Engineering Co.

Year Ended June 30: Net income of $1,229,852, which is equal to $3.05 per share, compared with a net income of $923,428 in the previous year. Net sales in the 1954 fiscal year amounted to $26,576,394, contrasted with $27,338,685 in the preceding fiscal year. The report covers the company and a subsidiary concern.

Union Carbide and Carbon Corp.

Nine Months to September 30: Net inincome of $603,548, which is equal to $2.18 a share, compared with $78,897,595, or $2.72 a share, in the corresponding period of 1953. Sales for the 1954 period amounted to $667,143,639, compared with $782,865,344 in the 1953 period.

Hewitt-Robins Inc.

Nine Months to September 30: Net income of $603,548, which is equal to $2.10 a share, compared with $865,354, or $3.01 a share, in the same nine month period of 1953. Net sales in the 1954 period amounted to $26,410,944, compared with $28,629,816 in the 1953 period.

Parker Appliance Co.

Quarter Ended September 30: Net income of $268,490, which is equal to 69c a share, compared with $281,009, or 73c a share, in the corresponding quarter of the preceding year. This report covers the company and wholly-owned subsidiaries.

DeVilbiss Co.

Nine Months to September 30: Net income of $530,807, which is equal to $1.77 a share, compared with $641,243, or $2.14 a share, in the first nine months of 1953. This report covers the activities of the company and its wholly-owned subsidiary.

Boston Woven Hose and Rubber Co.

Year Ended August 31: Net loss of $432,005, compared with a loss of $208,746 in the preceding year. Net sales for the year amounted to $15,259,855, compared with $16,683,690 in the year ended August 31, 1953.

Okonite Co.

Nine Months to September 30: Net income of $701,866, which is equal to $4.11 a share, compared with $2,082,373, or $12.95 a share, in the same period of the preceding year.

Thermoid Co.

Nine Months to September 30: Net income of $614,983, which is equal to 66c a common share, compared with $886,558, or $1.00 a common share, in the first nine months of 1953.

Allen Industries, Inc.

Nine Months to September 30: Net income of $978,088, which is equal to $1.75 a share, compared with $865,530, or $1.55 a share, in the corresponding period of the preceding year.

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POLYSAR KRYNAC—A medium oil resistant butadiene acrylonitrile polymer is made by the "Cold Process." It is engineered to assist the processor—Its characteristics include:

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LOS ANGELES NEWS

The October 5th meeting of the Los Angeles Rubber Group, held at the Statler Hotel in Los Angeles, Calif., featured an address by Merton L. Studebaker of the Phillips Chemical Co., Akron, Ohio. Mr. Studebaker spoke on "Chemical Forces in the Reinforcement of Rubber by Carbon Black". Mr. Studebaker stated that reinforcement is the improvement of rubber which makes it more suitable for a given use. Carbon black, he declared, is the chief reinforcing agent.

The nature of the interaction between carbon black and rubber is very incompletely understood. There can be little doubt that physical forces of attraction exist between the carbon black and the rubber, and also that attractive forces exist between the carbon black particles themselves within the rubber matrix. However, it has not been established that these physical forces are sufficiently strong to account for the phenomenon of reinforcement.

Mr. Studebaker observed that chemical forces would be expected to be stronger, but direct evidence for their existence is fragmentary and generally inconclusive in the most highly reinforced compounds, e.g., fine particle size furnace blacks in natural or GR-S type synthetic rubber. Chemical forces are indicated in the interaction of various types of rubber with channel type carbon black during heat treatment. Similar effects can be brought about in rubber-furnace black systems by various "promotors." However, he said, this phenomenon in itself is not what is meant by reinforcement. It can be more properly thought of as augmenting reinforcement.

Preliminary results of studies on the nature of surface groups on carbon black indicate the likelihood of the presence of quinone type oxygen. Reactions of quinone type oxygen with unsaturated groups or with the alpha methylene hydrogen groups of rubber are definitely possible. This could account for the augmenting of reinforcement through heat treatment of the channel black masterbatches. The speaker also showed that carbon black and sulfur will react at vulcanizing temperatures. This allows speculation on the possibility of formation of carbon-sulfur-rubber linkages during vulcanization, he concluded.

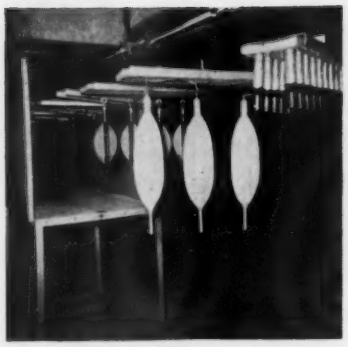
The non-technical portion of the meeting was addressed by R. A. "Dutch" Derr, ex-professional baseball player.

The November 3rd meeting of the Los Angeles Rubber Group was to have consisted of a panel discussion on accelerators, with particular reference to the characteristics and proper use of such chemicals. A discussion period was also to be held on any phase of rubber cure acceleration that might have developed during the meeting. J. W. Wechselberger (Plastic & Rubber Products) was to have served as moderator for this meeting. The panel was to have included B. R. Snyder (R. T. Vanderbilt), B. Garvey (Sharples Chemicals), W. A. Fairclough (Naugatuck Chemical), A. R. Davis (American Cyanamid), M. C. Throdahl (Monsanto Chemical), and H. J. Jordan (DuPont). The non-technical portion of the meeting was to have been addressed by Leo "Lippy" Durocher, manager of the New York Giants.

A few short years ago, Latex Products of Los Angeles, Calif., started operations in a 14 by 40 foot building producing one surgical item. A short time ago, the company completed construction of a new plant providing over 6,000 square feet of floor space and equipped it to produce a complete line of surgical rubber goods. In addition, the plant has a complete development laboratory.

Among the many items now in regular production are several types of oxygen bags, corrective pessaries, colostomy and illiostomy bags, endotracheal catheters and inflatable cuffs, latex dipped metal coatings and ear ring pads. The accompanying photograph shows one phase in the production of oxygen bags, that step when the bags have reached the end of the tunnel run cure.

Shown above is the new plant of Latex Products at Los Angeles, Calif.



This photograph shows oxygen bags at the end of the tunnel run cure at the Latex Products' Los Angeles plant.

The company reports that recently aircraft firms have called for numerous specification items of the dipped latex type that have been developed by Latex Products. The company now has all the facilities needed for the complete development of any and all items pertaining to oxygen and hospital use. It can also produce specification or non-specification dipped latex products.

I. W. (Ike) Robertson is owner of Latex Products, with Daryl Johnson as general manager.

Appointment of Ted R. Carrell as O-ring sales engineer for the Pacific Coast territory has been announced by D. W. Holmes, sales vice-president of the Parker Appliance Co., Cleveland, Ohio. Mr. Carrell will headquarter at the Rubber Products Division of the company, at 1538 South Eastern Avenue, Los Angeles 22, but will be under the direction of Tommy J. McCuistion, rubber products sales manager in Cleveland, Ohio. Mr. Carrell's new duties include cooperative work with authorized Parker O-ring distributors.

For the past two years, Mr. Carrell was lead engineer on fuel and hydraulic line connectors for E. B. Wiggins. Before that he was associated with North American Aviation as research enginer. He attended San Diego State College where he became a member of Sigma Chi Fraternity. He went on to the University of California at Berkeley from which he obtained his B.S. degree in mechanical engineering in 1950.

National Aniline Division, Allied Chemical & Dye Corp., announced the opening of a branch office in Los Angeles, Calif., on October 1, 1954. The office, which has a complete warehouse stock, is located in Vernon, in the heart of the central manufacturing district, at 4814 Loma Vista Avenue. The telephone number is LOgan 8-2257.

Joe Kerley has sold his interest in Rubber Teck, Inc., Gardena, Calif., and for the time being has retired from business.

Richard Peterson of Interstate Rubber Products Corp., has been named sales manager succeeding Lester Lyons, who has resigned to enter another business.

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is the word for rubber compounds containing

POLYMEL DX

POLYMEL DX is a medium soft, friable, polystyrene-type resin, amber-to-brown in color but with no coloring properties. It functions as a plasticizer and dispersing aid in natural and synthetic rubber compounds. The use of from 5 to 35 parts on the rubber, depending on the loading of the compound, imparts the highly desirable, smooth working quality so necessary for efficient tubing.

POLYMEL DX lends a lubricating action to extrusion compounds, thus permitting high speed operation. With correct die heat and pressure, POLYMEL DX stocks have a fine surface finish and retained outline in the uncured state. POLYMEL DX is useful in practically all extruded goods, including wire insulation compounds. POLYMEL DX functions particularly well in highly loaded compounds.

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5000 lbs. to truckloads	— .1425¢ lb.
Truckloads	— .1375¢ lb.

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CANADIAN NEWS

The General Tire and Rubber Co. of Canada has announced that it has acquired a 200-acre industrial site in Disbury, Alberta, 48 miles north of Calgary. Lloyd J. Falkenhagen, vice-president in charge of operations at Welland, said demand for industrial rubber products and plastics is sufficient to warrant establishing the firm's fourth Canadian unit.

D. S. Grant has been appointed general superintendent of the main plant of the Canada Wire & Cable Co., Ltd., at Toronto (Leaside). Mr. Grant, who has been associated with the company since 1939, was responsible as equipment superintendent for the co-ordination of construction and installation of equipment during the company's expansion program over the past three years.

Gutta Percha & Rubber, Ltd., has announced plans to install a Rotocure press at its plant in Toronto. Cost of the plan is $340,000, the company announced. The press will be used to cure industrial belts up to 78 inches in width, and can also be used to cure matting, flooring, packing, and many other rubber products. A plant expansion is now under way to house the press, which will be installed in March, 1955.

Canadian Bronze Powder Works, Ltd., Montreal, has been appointed exclusive distributor for the full line of industrial adhesives manufactured by Rubber & Asbestos Corp., Bloomfield, N. J. The Canadian organization maintains branch offices and warehouses in Montreal, Toronto and Vancouver with representation in all provinces.

Rubber & Asbestos Corp. manufactures a wide range of rubber-based and synthetic resin-based adhesives and compounds used in a wide variety of industries, including "Plymaster" adhesive coated copper, the revolutionary new development in the manufacture of printed circuits. All their products will be available in Canada for prompt shipment from Canadian warehouses, it was reported.

Canadian Industries (1954) Ltd. has opened a $15,000,000 polythene plant at Edmonton, Alberta. The new plant, which employs 250 persons, is expected to take care of Canadian demand for the material for some time to come. Canadian Industries (1954) is controlled by Imperial Chemical Industries, Ltd.

Canadian Industries has also announced plans to raise about $51,000,000 by selling debentures and additional common stock. The company has offered for public distribution $25,000,000 of 3¾% debentures, due November 15, 1974. The other $26,000,000 will come from a 1,434,891 share offering to stockholders in the company of record October 29, in the ratio of one new share for each five held.

Imperial Chemical Industries, owner of 82.3% of Canadian Industries common, is expected to subscribe for its portion of the stock issue. Canadian Industries will use $18,000,000 of the proceeds from the twin offerings to pay advances received from its parent company. The rest will go for expansion and other corporate purposes.

A Canadian manufacturer recently recommended a 20% tariff on imports of polyethylene resins from the United States and other countries. Canadian Industries, Ltd., told the Tariff Board the natural gas product, which is used to make plastic goods, now enters duty free from the United States. The company contended a tariff of 20% or 8 cents a pound is needed to maintain a market for the products of its $15,000,000 plant at Edmonton.

Named to Rubber Section Post

Tom J. Cain, Jr., director of safety for the B. F. Goodrich Co., Akron, Ohio, was named general chairman of the Rubber Section of the National Safety Council at the 42nd National Safety Congress held recently in Chicago, Ill. Mr. Cain succeeds R. W. Fickes of the Goodyear Tire & Rubber Co., to the post of directing NSC Rubber Section Affairs on a national basis for the year 1955. The announcement was made at a luncheon meeting attended by over 100 rubber industry safety men in the La Salle Hotel in Chicago. J. T. Kidney, Goodyear safety director, was toastmaster at the meeting. Dr. Rex H. Wilson, medical director for Goodrich, who recently returned from a trip to Italy, France and England, commented on industrial hygiene and safety problems abroad. Mr. Cain also addressed the American Society of Safety Engineers meeting in the Hotel Congress in Chicago, on the subject "Incentives for Greater Interest in Industrial Accident Prevention." Over 10,000 industrial, traffic, and off-the-job safety specialists attended the annual national congress on safety.

Gets Tubeless Tire Contract

The first contract for tubeless airplane tires for the U. S. Air Force has been awarded to the Goodyear Tire & Rubber Co. at Wright Patterson Air Force Base, Dayton, Ohio. The contract is for 24 by 7.7 tubeless tires for the nose wheel of the F-105 fighter plane made by the Republic Aviation Corp. Goodyear currently is designing all of its tubeless airplane wheels so they can be used with both tubeless and conventional tire and tube. The company states that it has orders on hand for tubeless tires and wheels for several new models of airplanes for 1955.

To Build New Neoprene Plant

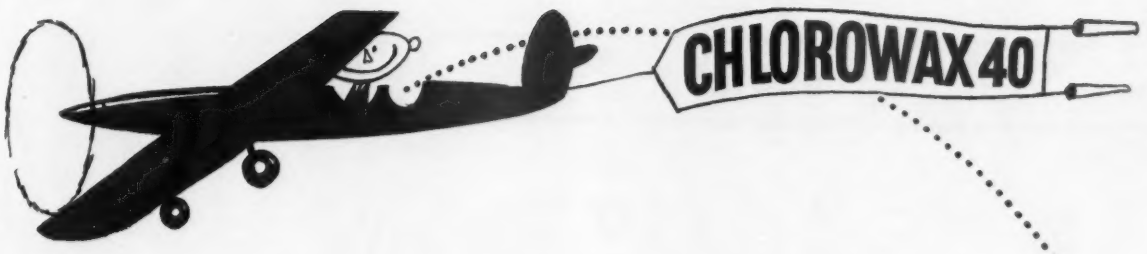
E. I. du Pont de Nemours & Co., Inc., has announced that it will construct a new plant to manufacture neoprene at Montague, Mich. Work is scheduled to start in the spring, with about 500 to be employed at the peak of construction. Earlier this year, the company made known its preliminary plans, and options were taken on approximately 1,000 acres in the Montague area adjoining the site of the Hooker Electrochemical Co. The plant facilities will consist of a combination office building and laboratory, three manufacturing buildings and a number of smaller structures. Design and construction will be conducted by DuPont's Engineering Department. Site clearing is scheduled to get under way in the early spring, and completion of the plant is scheduled late in 1956. The plant will employ about 250 persons. The Hooker plant will manufacture hydrogen chloride for DuPont, delivering it by pipeline. Another plant which will be built by Union Carbide will generate acetylene, the other major raw material for neoprene, and will pipe it into the DuPont plant. Neoprene, said to be the first commercially successful general purpose synthetic rubber, was introduced by DuPont in 1931 as a direct result of long-range, fundamental research. DuPont's present output of neoprene comes from its Louisville, Ky., plant where an expansion project is currently nearing completion.

Interstate Joins Skinner Engine

Interstate Welding Service has announced an enlargement of its facilities for the repair of Banbury mixers by virtue of its new association with the Skinner Engine Co. of Erie, Penna. Interstate is now operating as a division of Skinner Engine, with offices in Erie. Interstate was founded in 1933 in Chicago, Ill., by Gordon McLean. Since that time, the company has been exclusively devoted to the rebuilding and repair of Banbury mixers. In 1936, the company moved to Akron, where it remained until this latest move. J. L. Skinner, president of Skinner Engine, joined Mr. McLean in announcing the new arrangement. Mr. Skinner stated that he welcomed the uniting of Mr. McLean's 21 years of specialized Banbury experience with his company's large plant facilities and 86 years of experience in precision machining.

Pirelli Merges Companies

At recent special meetings of shareholders of Pirelli, S.p.A., in Milan, Italy, it was voted to merge the controlled companies of its Cable Division (SICE, Leghorn; FICE, Naples; Filati Ludici, Bergamo; Fongaro, Cusano Milanino, and Came, Milan) into the parent organization. This decision was prompted by the advantages arising from a technical, industrial and commercial amalgamation, resulting in increased productivity and lowered costs. The aggregate capital stock of the controlled companies amounts to more than 900,000,000 lire, with approximately 1,000 employees involved. The actual merger will be effective as of January 1, 1955.



How to Lower Vinyl Compounding Costs

Chlorowax* 40 and Surfex* MM can be used separately or in combination to lower vinyl compounding costs and increase batch yields with no sacrifice in quality. Chlorowax 40 is DIAMOND ALKALI's liquid chlorinated paraffin which has gained wide acceptance as a low-cost co-plasticizer. Surfex MM is one of DIAMOND's precipitated calcium carbonates—a filler of high uniformity and purity.

The table below shows how these DIAMOND Chemical products can be used to produce two-way savings. Your nearby DIAMOND Sales Office can show you other moneysaving formulas and supply detailed cost comparisons, or write DIAMOND ALKALI Co., 300 Union Commerce Building, Cleveland 14, Ohio. **

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Chlorowax 40	10
Stabilizer	3
Stabilizer-Lubricant	0.5
Surfex MM	20
	183.5
Hardness	85A
Tensile Strength	2600 psi
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Brittleness-Temperature	-29°C
Heat Loss	4.7%

DIAMOND ALKALI CHEMICALS

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OBITUARIES

Theodore A. Haschke

Theodore A. Haschke, director of sales of the Industrial Chemical Division of the Stauffer Chemical Co., New York, N. Y., and a director of the Old Hickory Chemical Co., Old Hickory, Tenn., died on October 5th in New York Hospital. He was 56 years old. Born and educated in Austin, Texas, Mr. Haschke served in the Army during World War I. He began his career as a salesman for the Round Rock White Lime Co. in Round Rock, Texas, in 1919. In 1926, he joined Stauffer as a salesman in the Houston territory and six years later was transferred to New York. In 1942, Mr. Haschke was named sales manager of the company's Eastern Division. He held this position until his most recent appointment in January of this year. Mr. Haschke belonged to the Chemists' Club, the Uptown Club and the Salesmen's Association of the American Chemical Industry. He is survived by his wife.

Dr. Charles I. Post

Dr. Charles Irwin Post, vice-president of the Nopco Chemical Co., Harrison, N. J., died on October 10th after a short illness. He was 56 years old. Dr. Post had been in charge of the company's Vitamin Division since January, 1953. A graduate of Rutgers University, he received his doctorate in chemistry from Columbia University in 1925, and joined Nopco the same year. Before becoming vice-president, he served as sales manager of the Vitex Laboratories Division, general sales manager of the Vitamin Division and assistant sales manager in charge of vitamin sales. He was the founder and first president of the National Vitamin Oil Association and a former president of the Short Hills Association. Dr. Post belonged to the Chemists' Club, the Essex Club of Newark and the Baltusrol Country Club. He is survived by his wife, a son and a daughter.

Ogden A. Kantner

Ogden A. Kantner, president of the United Clay Mines Corp., Trenton, N. J., died on October 10. He was 43 years old. Mr. Kantner had participated in the reorganization of the United Clay Mines Corp. in 1952, and had been president of the company since that time. Associated with the concern for some years, he served successively as assistant general manager, manager, vice-president, and finally, president. For some years he had been active in the affairs of the American Ceramic Society. Born in Cresskill, N. J., he was graduated from Lehigh University in 1931. Mr. Kantner was a member of the American and New Jersey Ceramic Societies, Rotary Club, Carteret Club, Engineers Club, and the Trenton Country Club.

Thomas J. Willey

Thomas J. Willey, plant manager of the Typrene Division of the Ideal Roller and Manufacturing Co., died on September 23rd in Whittier, Calif. He was 40 years old. Born in Laurel, Miss., Mr. Willey was graduated from the Ohio Mechanical Institute. He subsequently moved to California and joined the Kirkhill Rubber Co. in Los Angeles. Later, he became head of the Roller Division of Rubbercraft Corp. During World War II, he served with distinction in the Navy as a chief petty officer. He joined the Typrene Rubber Co. as a partner in 1944 and six years later, when Typrene merged with Ideal Roller, he became West Coast factory manager. For several years Mr. Willey had been an active member of Tlargi. Surviving are his wife and two daughters.

James A. Davidson

James A. Davidson, treasurer of the Dural Rubber Co., Flemington, N. J., died on October 10 at Mercer Hospital in Trenton, N. J. Born on July 12, 1891, at Stoughton, Mass., he attended the public schools of that city. In 1941, he acquired control of Dural Rubber. Previously, he had been associated with the Essex Rubber Co. of Trenton, N. J., the Rainbow Rubber Co. of Butler, Penna., and the Quabaug Rubber Co. of North Brookfield, Mass. Mr. Davidson was a member of the Trenton Lodge, B.P.O.E. He is survived by his wife and son.

John H. Kelly

John H. Kelly, product manager of the Footwear Division of the Tyer Rubber Co., Andover, Mass., died at his home in Andover on October 19. He was 65 years old. Mr. Kelly joined Tyer Rubber in 1935 as assistant sales manager, after employment with several other major rubber concerns. A mechanical engineer, he was graduated from the American School of Correspondence in Chicago. He served on the Andover Board of Public Works from 1946 to 1952 and was a member of several fraternal organizations. He is survived by his wife, three sons and a daughter.

Vaughn Y. Bell

Vaughn Y. Bell, since 1945 manager of fleet tire sales and service for the Goodyear Tire & Rubber Co., died on October 28 in New York Hospital, New York, N. Y. He was 59 years old. Mr. Bell had been attending the annual meeting of the American Trucking Association in New York City, when he was taken ill. He had been with Goodyear for more than 30 years. He is survived by his wife and son.

Need a personal file of RUBBER AGE? Use the coupon on Page 325.

New Use for Cabflex DDP

The Plastics Chemicals Division of Godfrey L. Cabot, Inc., Boston, Mass., has announced a new use for "Cabflex DDP," Cabot's didecyl phthalate. Cabflex DDP has been tested and proved superior in high temperature wire vinyl insulation compounds . . . and at lower formulation costs, the company declares. Cabflex DDP is said to have the lowest volatility of any primary monomeric ester which is commercially available as a vinyl resin plasticizer. A high temperature vinyl insulation compound, to meet Underwriters' Laboratory specifications, must retain a certain percentage of its original elongation after aging at an elevated temperature, a property dependent mainly on plasticizer volatility. For many years, tricresyl phosphate (TCP) was the only commercially available primary monomeric plasticizer classified as having low volatility. For this reason, it was used as the sole or major plasticizer in all 80°C. vinyl insulation compounds used by the wire and cable industry. In July of 1952, Cabot introduced Cabflex DDP, announced as the first all-decyl phthalate, and the first commercially available primary monomeric plasticizer to have a volatility lower than TCP. In addition, Cabflex DDP is said to offer the following advantages over TCP: lower pound volume cost, greater stability, with no discoloration during processing, less yellowing and practically no tack after exposure to ultra-violet light; low temperature characteristics equivalent to DOP; and lower water extraction.

G-E SE-30 Silicone Gum

A new, low shrinkage, general purpose silicone rubber gum has been announced by the Silicone Products Department of the General Electric Co., Waterford, N. Y. Designated as "SE-30," the new gum is being used in compounds from which parts requiring close tolerances may be produced. Because the shrinkage of such material is extremely low, molds and dies designed for organic rubber may often be used with compounds made from SE-30 silicone rubber gum, the company states. Compounds for conventional type molding, extrusion, calendering, knife coating or dip coating are readily formulated with the new gum. They offer high tensile strength, excellent low compression set and good resistance to elevated temperatures, G-E engineers state. Good electrical properties, flexibility down to —65°F., and excellent hot tear strength from the mold are other features offered by compounds incorporating SE-30 silicone rubber gum.

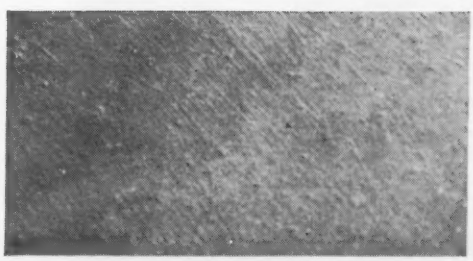
Stephen J. Wargo

Stephen J. Wargo, production manager of the Faultless Rubber Co., Ashland, Ohio, died on October 2nd after suffering a heart attack. He was 55 years old. Mr. Wargo was a native of Strong, Penna., and was graduated from Bucknell University. He was formerly associated with the Sun Rubber Co. as a division superintendent. Surviving are his wife, a daughter and three sons.

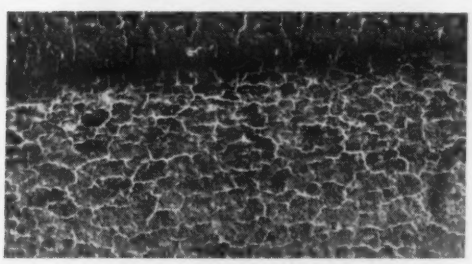
No sign of checking. The rubber insulation on this wire contains Sunoco Anti-Chek. Compare it with the sample at the right.

Surface checking is clearly evident in the rubber covering of this wire—which does not contain Sunoco Anti-Chek.

STOP SURFACE CHECKING AND CRACKING WITH SUNOCO ANTI-CHEK



Sunoco Anti-Chek keeps black sidewalls smooth... even after prolonged storage.



Notice the cracking and checking of the sidewall on this tire which does not contain Sunoco Anti-Chek.

Sunoco Anti-Chek is unique . . . there's no other anti-checking wax like it. It's a narrow-cut primary product, not a blend. It is completely controlled from crude oil to finished product by the same company that originally developed it. And it is made in the most flexible wax plant in the world. To you this means a completely uniform product that can be depended on for the same excellent results tomorrow, next year, 10 years from now!

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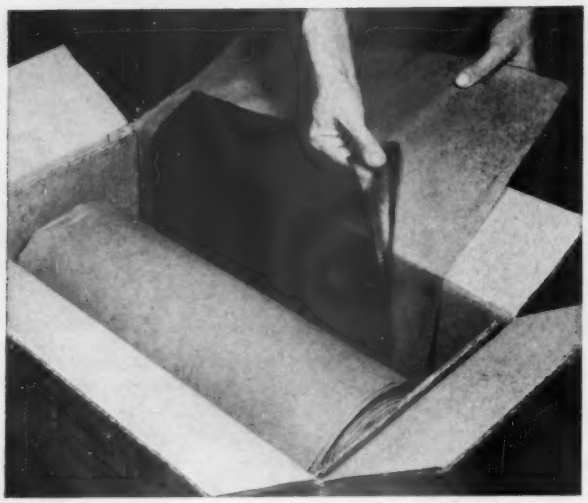

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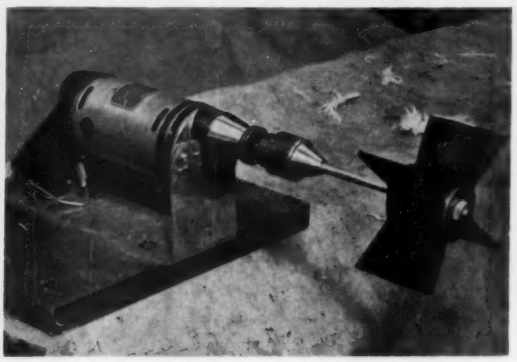
NEW GOODS

McKendree Chicken Picker

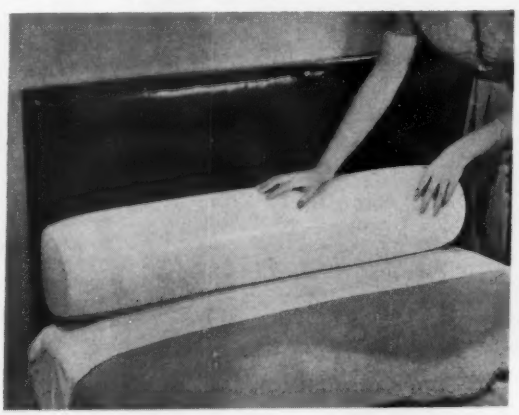
Scott W. McKendree, 1893 Del Moro, Klamath Falls, Ore., inventor and manufacturer of the McKendree Duck Picker, has now developed a unit which will clean a chicken of feathers and pin feathers, mechanically, in six minutes or less. The "Chicken Picker" is an attachment for any electric hand drill or motor which will hold a ¼-inch drill. Consisting of a fan bladed rubber head mounted on a metal shaft, the unit revolves rapidly and



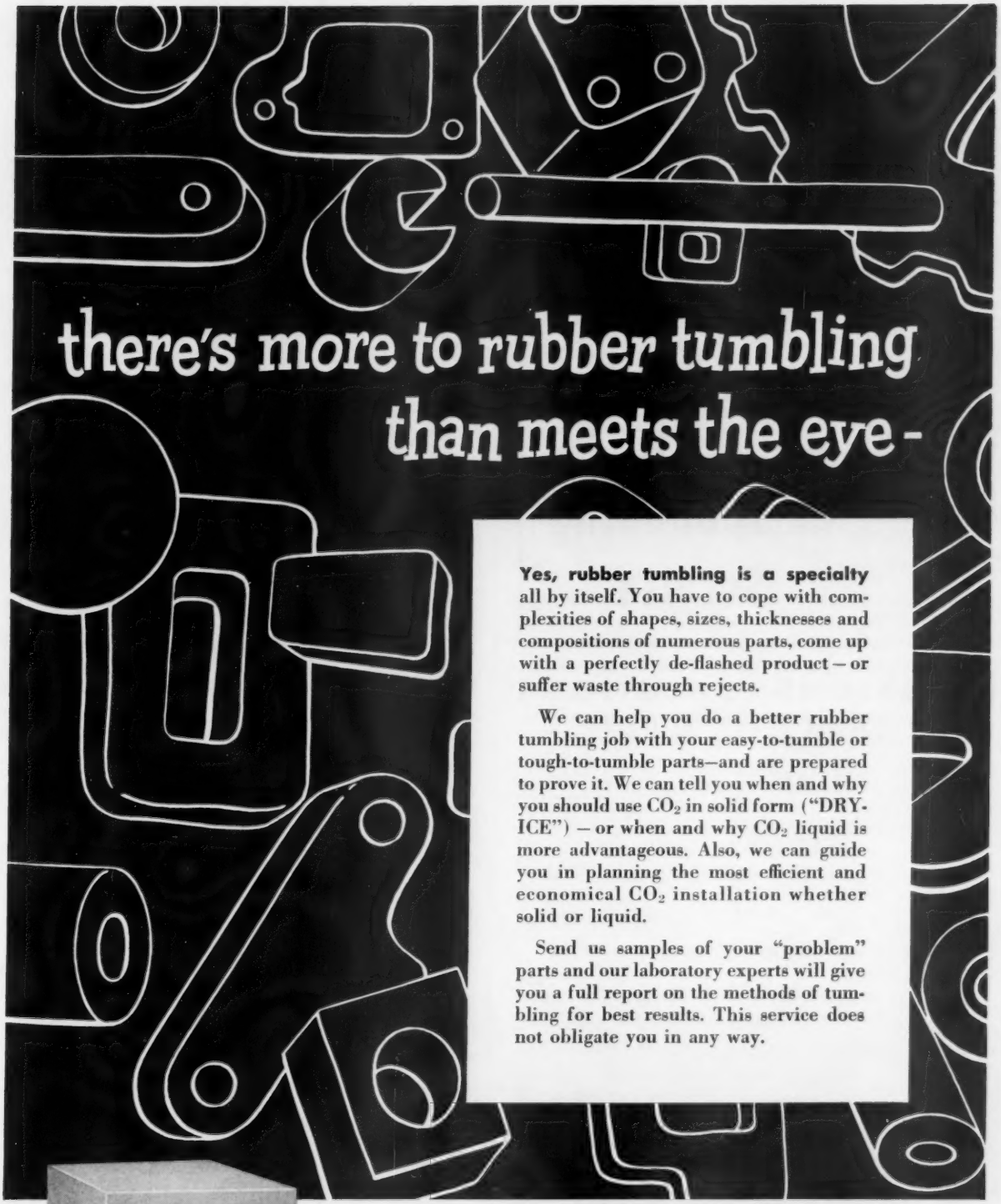
picks the chicken. The chicken is scalded before picking, and the operator need only hold the bird against the picker head and manipulate it so the blades can get at all the feathers. It is said to be especially efficient in doing the final finishing work which is now done by hand.

Inflatable Krene Bolster

Plastic Innovations, Inc., 185 Riverdale Ave., Yonkers, N. Y., has introduced a new inflatable bolster made of Krene. Beds are said to be quickly and neatly made with the new bolster which can be deflated and folded away for storage. Blowing through a handy valve in-



flates the bolster for use. When inflated, it retains its firm, round shape and is easy to handle, the company states. About eight inches in diameter, the inflatable bolster is available in 54, 36 and 24 inch lengths for standard single and double beds, junior bed or crib.



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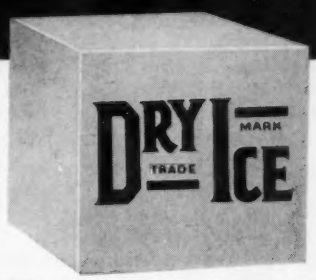

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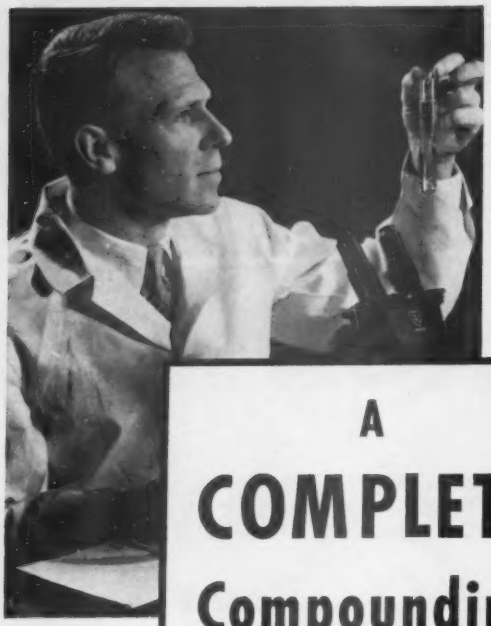

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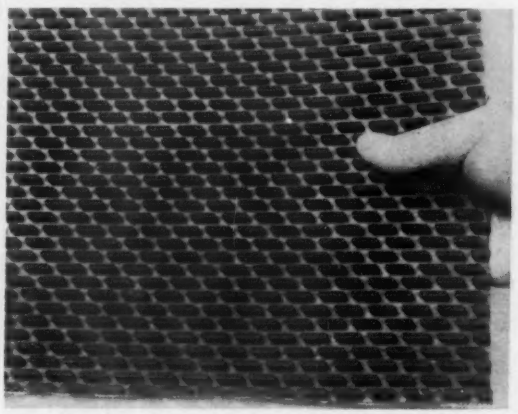
U.S. SteepGrade Package Conveyor

A new package conveyor belt with a slip-resistant surface, developed by the U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y., will carry paper board cartons, wooden cases, cellophane-wrapped articles and other merchandise up inclines as steep as 45°. This is said to be as much as 50% steeper than the lift angle of most conventional package conveyor belts. Tough, springy, rubber cleats covered with tiny grippers hold the packages firmly in place on the "U.S. SteepGrade Package Conveyor." Molded construction of the belt anchors the cleats strongly to the carcass and prevents them from being torn loose by heavy cases. One square foot of the cover contains approximately 960 cleats, each

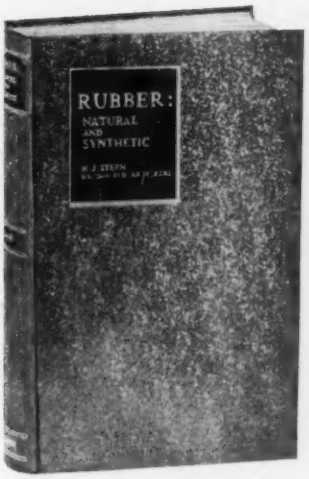


5/32-inch high, ½-inch wide and ⅛-inch long. The cleats are spaced in diagonal rows ⅛-inch apart both lengthwise and crosswise. The belt is self cleaning. As it flexes over pulleys, the cleats, which are arranged in staggered rows, spread apart, throwing out dirt and other foreign substances. When used outdoors on portable conveyors, the cover design will allow water to run off easily in rainy weather. The belt comes in widths up to 48 inches and is expected to find wide use in mail order houses, department stores, breweries, super markets and in most shipping and warehousing operations. The photograph above shows the rubber cleats covered with tiny grippers on the surface of the new conveyor belt.

Air Mat Inflatable Fabric

An inflatable fabric which is said to provide the strongest structural beam for its weight ever developed has been announced by the Aviation Products Division of the Goodyear Tire & Rubber Co., Akron, Ohio. Called "Air Mat", this rubber-coated nylon fabric weighs only two pounds a square yard and is capable of containing high pressures. It also provides excellent insulation against heat, cold and vibration, the company states. Commercial applications which the company is considering for this versatile fabric range from collapsible outdoor furniture which can be deflated for easy storage to reel-out ladders for aircraft crash landing. The accompanying photograph shows a four-man Air Mat shelter, designed by Goodyear for the U. S. Air Force. The shelter can withstand heavy Arctic ice and snow loads and provides vacuum weather-proofing. Goodyear

first edition . . . just published



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RUBBER:

Natural and Synthetic

By H. J. STERN

B.Sc., Ph.D., A.R.I.C., F.I.R.I.

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About the Book–

This book fills the need for an English-language text book on all phases of rubber and rubber products manufacture. As indicated by the chapter heads, the book is of interest to rubber manufacturers, suppliers of chemicals and machinery, rubber technologists and to students of rubber who will find present-day technical procedures clearly defined.

Part I covers natural rubber production, composition, properties and vulcanization as well as compounding ingredients, machinery, reclaiming and latex. Part II covers the development, manufacture and uses of synthetic rubber and latices, synthetic resins and plastics. In addition the manufacture of various rubber products are fully covered, including soles and heels, extruded goods, bonding, hollow goods, sponge and expanded rubber, belting, hose, tires, tubes and hard rubber.

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About the Author—

Dr. Stern has been engaged as a chemist in the rubber industry for more than 25 years and since 1935 has practiced successfully in London as a Consultant. He is the author of "Practical Latex Work" and of many publications concerned with the scientific and technological aspects of natural and synthetic rubber.

SUMMARY OF CONTENTS BY CHAPTERS
Part I

1. **Historical Introduction; Mastication; Vulcanization.**
2. **Plantation Rubber.**
3. **Natural Rubber: Composition, Reactions, Derivatives.**
4. **Properties of Vulcanized Rubber.**
5. **Compounding Ingredients.**
6. **Rubber Machinery; Solvents and Solutions; Reclaiming.**
7. **Latex.**

Part II

8. **Synthetic Rubber (History and Development).**
9. **Manufacture and Technology of Synthetic Rubbers.**
10. **Synthetic Rubber Latices.**
11. **Synthetic Resins; Plastics.**
12. **Manufacturing Processes (of various rubber products).**
13. **Testing and Analysis.**

Sources of Further Information; Metric Equivalents; Subject Index.

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says the fabric is woven, coated and fabricated as two plies of superimposed fabric with connecting nylon threads of fixed length connecting the upper and lower plies. In this new concept of internal load-bearing design, Goodyear says, the nylon threads are actually

load-bearing members maintaining the predetermined distance between the two layers of fabric. As a result, the fabric remains flat when inflated. Bursting strength of the fabric is rated at 20 pounds per square inch to 200 pounds per square inch and the material depths of Air Mat fabric in production goes from ⅛ inch to 3 inches.

Kushion Kover Seat Covers

Farber Brothers, Inc., 821-41 Linden Avenue, Memphis, Tenn., has introduced a new line of automobile seat covers called "Kushion Kover". The new seat covers have the advantage of being lined with foam rubber, which is said to provide for a smoother ride and a neater fitting cover. The product can be installed in a matter of

minutes and no skilled labor is required. "Nu-Kar Kushion Kover" is shock-proof, fire and stain-resistant. "Fibre Kushion Kover" employs a strong, heavy-duty fiber that is water-repellent and easy to clean. The foam rubber lining on both prevents slipping or wrinkling, the company states.

Removable Rubber Drum Inserts

The production of removable rubber drum inserts for standard 55 gallon drums has been announced by the Automotive Rubber Co., Inc., 12550 Beach Road at P.M.R.R., Detroit 39, Mich. Called "Drumserts", the rubber inserts are preformed, independent linings made of compounded neoprene or sheet rubber. It is claimed that the inserts can be inserted in any standard drum simply and quickly. The rubber insert is merely set in the drum and the "lip" provided on the insert is lapped

over the top of the drum and pulled taut. This permits the "Drumsert" to grip the drum and maintain a stationary position regardless of handling. The company states that the units render any standard 55 gallon drum or barrel capable of holding acids and other corrosive materials. The inserts can be removed from drums in a matter of seconds by merely peeling the "lip" that laps over the sides of the drum. Along with these new rubber inserts, the company produces "snap-on" lids for drums.

Hydraulic Service O-Ring

A new aircraft quality O-ring for hydraulic service, just announced by the Parker Appliance Co., 17325 Euclid Avenue, Cleveland 12, Ohio, is said to extend the temperature rating of this kind of seal by approximately 37%. Temperature range of this new O-ring is —65° to +300°F., while that of the previous O-ring provided was —65° to +200°F. The new rubber material for this O-ring is designated "Parker Compound Number 590-5". It was developed by the company's Rubber Research and Development Laboratory to meet Military Specifications MIL-P-5516A and MIL-P-18017. After 50,000 cycles in MIL-O-5606 fluid at 300°F., this new compound showed no appreciable deterioration, the company states. From this material, Parker will mold the new O-ring in all standard sizes.

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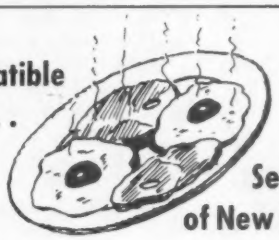

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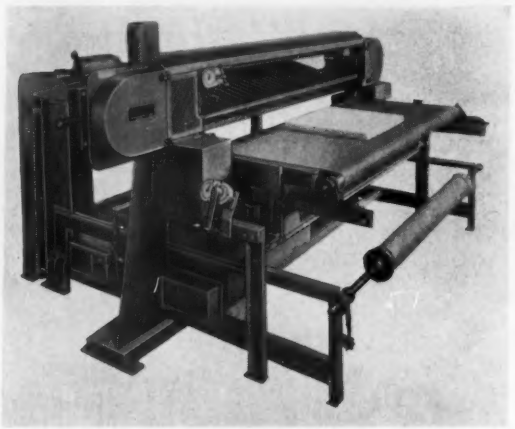
NEW EQUIPMENT

Falls Foam Rubber Splitting Machine

Development of a foam rubber splitting machine which will cut synthetic materials as well as natural foam and similar stocks has been announced by the Falls Engineering and Machine Co., Cuyahoga Falls, Ohio. Materials which can be cut by the new unit include many synthetics, latex and bonded foam, rubberized hair, cellulose sponge, cork, resin-bonded fiber, wood fiber and fiber glass. Designed by the Campbell Machinery Development Co., the splitter handles stocks in rolls, sheets and slabs. In many ways the unit is similar to one which the company has been manufacturing for the past two years. However, it is heavier and has a larger roll opening to accommodate thicker stock. Two sizes are available, one which splits stock up to 65 inches wide and another which will handle material up to 75 inches wide. Some materials can be split to ⅛-inch thickness and others as thin as 1/16th of an inch. The standard model in both sizes comes equipped with a gravity feed roll but the units are also available with a leather belt imput conveyor which feeds material into the splitting blade. Changes made in the new splitting machine include improvements in the let-off and wind-up of the stock.

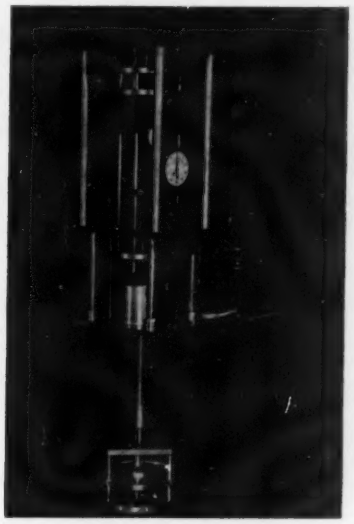


Improved Thelco Vacuum Oven

Precision Scientific Co., 3737 West Cortland St., Chicago 47, Ill., has redesigned its Thelco Vacuum Oven for greater accuracy and durability. Ribbon-type heater elements are used, operating at black heat for longer life and freedom from hazard. A sensitive hydraulic thermostat with external adjustment knob permits exact resetting to temperature. The insulated working chamber is made of cast aluminum for lighter weight and greater heat efficiency. A stainless steel drip pan is supplied, as well as a new formula neoprene rubber gasket selected for long operating life. The door is hinged at the top for easier closing and use of less space. The Thelco Model 19 Vacuum Oven is said to represent a new approach to the need of many research laboratories for a low cost, portable, controlled temperature vacuum chamber.

DuPont Sponge Deflection Machine

A new sponge deflection machine has been announced by the Castle Machine Company, New Castle, Delaware. It is an improved version of the machine originally developed in the DuPont Rubber Laboratories. The machine is designed to measure accurately the stress in p.s.i. required to cause a deflection of 25% on sponge samples.



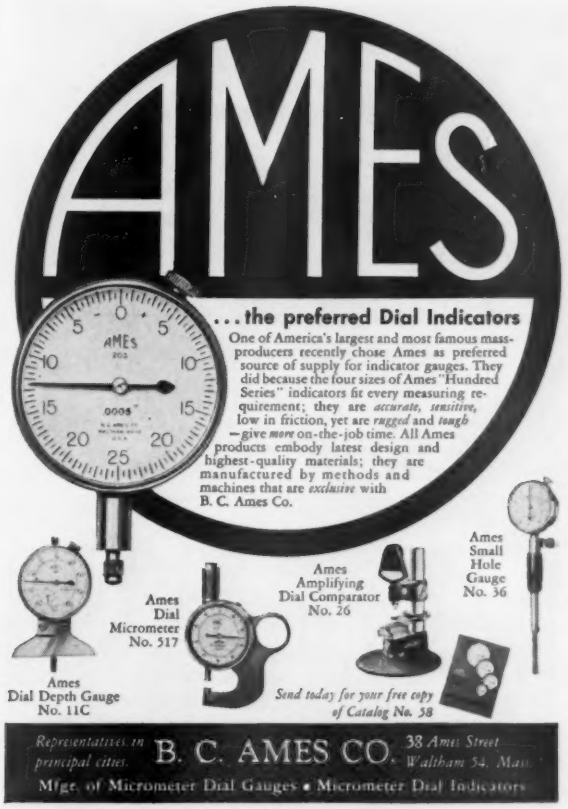
Attachments are available to facilitate testing at various temperatures to determine percent change in deflection and p.s.i.

Essentially, the machine consists of two parallel movable platens, a dial gauge and a spring scale. The upper platen is raised and lowered by a motor driven gear box. The lower platen is attached to the shaft in the top of the spring scale. The base of the scale is fitted with an arm on which rests an adjustable dial gauge. The dial gauge measures the height of the specimen at any given deflection in thousandths of an inch.

The unit is equipped with a scale ranging from 0 to 2 pounds. Different range scales are available at extra cost. A 1/20 hp motor is used to drive the unit. Two outstanding features of the sponge deflection machine are the spring-loaded brake which eliminates drift and the limit switches which cut off the power if the "safe" travel limits are exceeded. (The cover was removed in the accompanying photograph.)

New pH Instrumentation Systems

Complete systems for pH recording and control, which incorporate for the first time the new Beckman Model W amplifier, have just been announced by the Bristol Company of Waterbury, Conn. These pH instrument systems include a Bristol Electronic Dynamaster Potentiometer recorder or controller, a Beckman Model W Amplifier, electrode assemblies in either flow or immersion types, and a variety of final control elements for the addition of gaseous, liquid, solid, or slurried reagents.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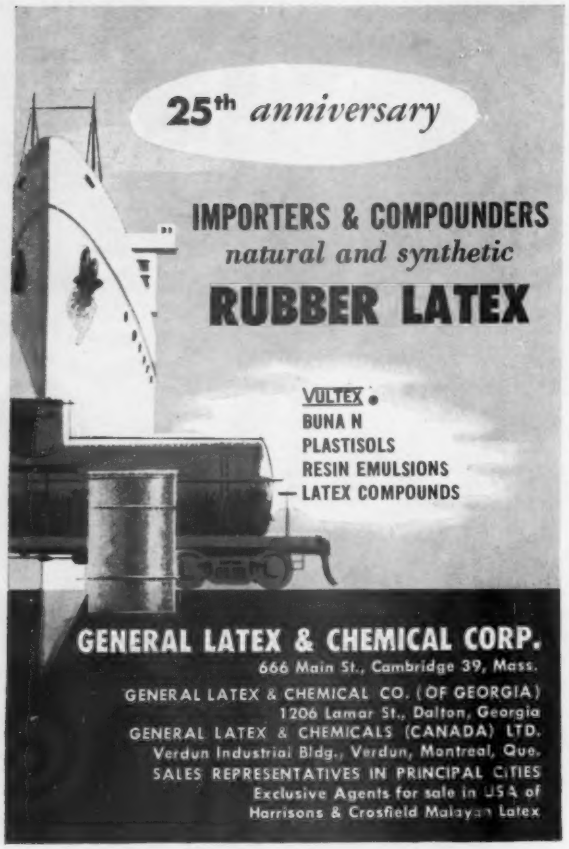

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Foxboro Temperature Transmitter

A new instrument which accurately measures process temperatures and pneumatically transmits the information to a central recording or controlling station has been announced by the Foxboro Company of Foxboro, Mass. Known as the Model 12A Temperature Transmitter, it is a non-indicating device of the "force balance" type with a calibrated accuracy of ½% of the temperature span and compensated for ambient temperature and barometric pressure variations.

Of rugged construction and simple in operation, the new transmitter is designed around a gas-filled thermal system which exerts force on a flapper-nozzle mechanism in proportion to the measured temperature. The resulting back pressure in the nozzle circuit, amplified through a relay and converted to a force through a bellows, quickly balances out the initial force and constitutes the 3-15 psi output transmitted by low cost tubing to the receiving instrument.

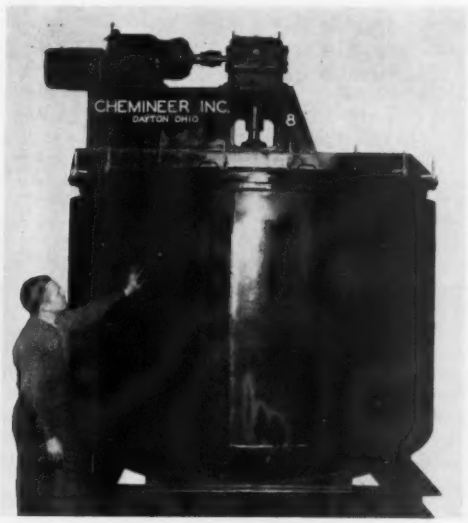
Spans ranging from 50° to 400°F. are available and can be utilized between the limits of −100° and +1000°F. Three and a half feet of Geon-protected capillary tubing connects temperature bulb to transmitter. A block and clamp mounting arrangement rigidly secures the seven pound instrument to any vertical or horizontal pipe or to a flat surface. The instrument is completely weatherproof, permitting installation in hazardous or corrosive outdoor areas.

Electrotherm Pneumatic Platen Press

A new press designed for use in plastic welding applications has been introduced by the Electronic Processes Corp., 912 San Antonio Road, Los Altos, Calif. Called the Electrotherm Model 453 Pneumatic Platen Press, it is so arranged that an over-travel mechanism determines the generator actuation, preventing premature application of high frequency power to the electrodes. The press is so designed that the live electrode can be located either above or below the work and control is achieved by an accurate timer with 1/10-second graduations. Light, strong frames, of high tensile aluminum alloy, make the new press capable of withstanding rigorous service requirements. The moving platen is supported for maximum rigidity and accurate alignment of electrodes. Up and down strokes of the press are controlled by individual solenoid valves with separate air-metering attachments so ram speed can be controlled in both directions.

Chemineer Latex Processing Unit

A new vessel-mixer unit designed specifically for the processing of latex was recently built by Chemineer, Inc., 1044 East 1st St., Dayton 2, Ohio. The unit, illustrated herewith, is one of a group of eight 2,000-gallon models built for one customer. According to the company, a full jacket with circulating baffles permits efficient cooling or heating, with a minimum time lag in reaching the required temperature. A hinged lid section with quick-action clamps is said to allow easy loading. A ventilation nozzle and thermowell are located on the stationary section of the lid. The agitator features turbine impellers designed for high circulating capacity and minimum shear. A variable speed drive permits precise speed settings for various blending phases. The polished stainless steel shell of the unit is reported to greatly facilitate cleaning.



Industron Corporation, Needham, Mass., has announced the availability of a **high frequency generator** for dielectric heat sealing which will operate within the F.C.C. allocated limits of the 27 megacycle industrial band, eliminating the need for a shielded room. The new generator, which has a single dial selector for a full range of desired sealing capacities, is said to be an improved power source for dielectric heat sealing of thermoplastic materials.

The **proportional synchronizer,** a device for storing a meter reading of varying magnitude and reproducing that information at a later period in a process, synchronized with the speed or movement of the processing line, has been introduced by the Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn.

A new **tester for tubes** from 6:00 by 20 up to 8 feet high, 33-inch cross-section for wheel sizes 20 inches and larger has been announced by the Bishman Manufacturing Co., Osseo, Minn.

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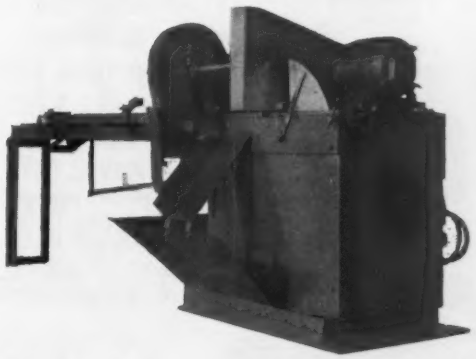

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REVIEWS

BOOKS

Bibliography of Rubber Literature: 1946-48. Edited by M. E. Lerner. Published by the Division of Rubber Chemistry of the American Chemical Society. Available from RUBBER AGE (Exclusive Sales Agents), 250 West 57th St., New York 19, N. Y. 6 x 9 in. 482 pp. $7.50.

As indicated by its title, the latest edition of this bibliography covers the literature and patents on rubber issued in the three-year period of 1946-48. As in previous editions, the data is divided into specific classifications covering all branches and phases of the rubber industry, and each reference includes the name of the author (if any), the title of the article or patent, the name and date of the journal or patent number, and, where possible, reference to published abstracts. Where the title of an article or patent is not self-sufficient, short, one-sentence abstracts are included for the convenience and edification of the user. The 1946-48 edition contains almost 6,000 references and a Journal Abbreviation Section, giving the full name and address of each journal mentioned in the reference sections, is again included. These bibliographies are compiled by a special Bibliography Committee, which is headed by Dr. John McGavack, of the U. S. Rubber Co., as chairman, with Mr. Lerner acting as editor-in-chief. Copies are distributed without cost to all members of the ACS Division of Rubber Chemistry in good standing at the time of publication. Copies are available to others at a cost of $7.50 each.

•

Die Polarnatur des Kautschuk. (Polar Nature of Rubber). By Dr. Heinrich Feuchter. Published by "Kautschuk und Gummi," Eichborndamm 141, Berlin-Borsigwalde, Germany. 6 x 8¼ in. 208 pp. Price: DM 15 (approximately $3.60). (In German).

The author of this work, Dr. Feuchter, was for many years chief chemist of Vorwerk & Sohn of Wuppertal-Barmen and his work on the structure of rubber and its polar effects has gained international attention. In this book, Dr. Feuchter sums up his own conclusions on the structure of rubber and the elastic behavior of rubber, gutta-percha and balata. Some hitherto experiments on stretching are revealed for the first time with diagrams of the test experiments reproduced. The author's own theories on structure and polar forces are applied to numerous factors, including vulcanization, crystallization, fillers, swelling, reinforcement and rubber derivatives. Unfortunately, the book is somewhat difficult to read and translators particularly will have trouble with some of the technical terms used.

F. P.

•

Chimie du Caoutchouc Naturel. (Chemistry of Natural Rubber). By Jean Le Bras. Issued by the French Rubber Institute, 42 Rue Scheffer, Paris 16, France. 6½ x 9½ in. 72 pp. (In French).

This 72-page booklet is actually a reprint of a chapter which was used in Volume 22 of "Traite de Chimie Organique," published last year by Masson & Co. of Paris. As indicated by its preface, it is an attempt to provide chemists with the principal known facts about natural rubber. Basically, the report is divided into three sections, treating with the composition and properties of latex, of what the author calls hydrocarbon rubber, and vulcanized rubber, in that order. Considerable space is devoted to the structure of rubber and to its chemical properties. Similar attention is paid to the physical properties of the vulcanized product. No attempt is made to furnish a complete bibliography, but some 40 general works are listed to enable the reader to pursue the subject in greater detail.

Deutsches Jahrbuch für die Industrie der Plastischen Massen: 1951-52. (German Year Book for the Plastics Industry: 1951-52). Edited by Karl Fabel. Published by Wilhelm Pansegrau Verlag, Uhlandstrasse 102, Berlin-Wilmersdorf, Germany. 5¾ x 8 in. 646 pp. Price: DM 50 (approximately $12.00). (In German).

The current edition of this "Year Book," which is actually a running manual on the German plastics industry, brings the literature up-to-date through the 1952 period. The previous edition, which covered the 1945-50 period, bridged the gap between the wartime era and the year of 1950. Like the previous editions, the current work covers progress made in all branches of the plastics field, with the data culled from both the technical and patent literature. Although the arrangement of the text has been maintained, with the first two sections devoted to the natural and synthetic plastics, respectively, the section on processing has been considerably expanded and greater attention has been given to the use of illustrations. Among the natural plastics covered are cellulose, lignin, viscose and cellulosic derivatives, while the synthetic plastics include the amino and phenol materials, polyamide, polyethylene, polyfluoroethylene and the polyester resins. Data on both natural and synthetic rubber is furnished in the report as well as information on the progress of the artificial fibers. The sections devoted to trade names and sources of supply have been completely revised and brought up-to-date. A subject index is included for convenience.

•

Successful Commercial Chemical Development. Edited by H. M. Corley. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9 in. 374 pp. $7.75.

Prepared by the Commercial Chemical Development Association, with Mr. Corley acting as editor-in-chief, this book is a comprehensive guide to organized chemical development and is believed to be the first book on the subject ever issued. It discusses in detail each step in the development of a product from the laboratory to commercial marketing, and outlines some of the career opportunities which exist in this expanding branch of the chemical industry. The different objectives of development groups during each stage of a new product's progress is also discussed and practical advice on the problems to be overcome is offered. Of special interest is a number of case histories of new products that were both successful and unsuccessful. Besides the technical phases mentioned, the book also devotes a number of chapters to other factors of product development, including advertising, pricing, packaging and labelling. One chapter discusses the toxicology, safety and handling of new products. There are 21 chapters in all and a cross-referenced index. The book should find service as a handbook for the chemical industry.

•

Fachkunde für die Gummiindustrie. Vol. II—Maschinenkunde. (Technology for the Rubber Industry. Vol. II—Machinery and Equipment). By Hans Eichstadt. Published by Fachbuchverlag, G.m.b.H., Karl-Heine-Strasse 16, Leipzig W-31, Germany. 6½ x 9 in. 254 pp. Price: DM 10 (approximately $2.50). (In German).

This is the second volume in the planned series of 10 volumes intended to serve as a "guide" to the rubber manufacturing industry. Whereas the first volume was prepared to cover the various materials used in rubber compounding (RUBBER AGE, October, 1954), this second one is devoted completely to machinery and equipment. It is divided into three sections, the first devoted to accessory and auxiliary equipment, the second to equipment used in the preparation of rubber for processing, and the third to vulcanizers, extruders, presses, calenders and other machinery used in the production of finished rubber goods. There is also a supplemental section containing some safety suggestions, numerical tables, and literature references. Like the previous edition, some references appear in the text to the "Capitalistic" and "Socialistic" approaches, and several descriptions of Russian equipment are included.

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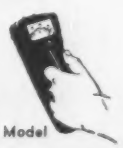

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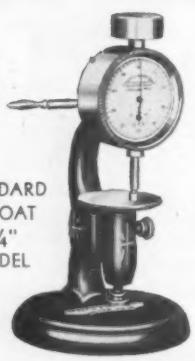

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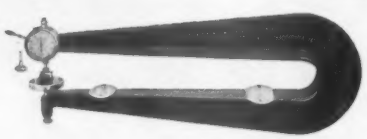

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REVIEWS (CONT'D)

BOOKLETS, CATALOGS, etc.

Why the Small Fork Truck? By Nathaniel Warshaw. Materials Handling Division, Market Forge Co., Everett 49, Mass. 8½ x 11 in. 28 pp.

Combining an academic approach with clear layman's language, this booklet shows how small and medium-sized plants can compete with big business in materials handling efficiency. It is written as a training aid in industry and as a text for teachers and students. The booklet describes how a small power fork truck can be used in upper story installations and for unloading motor trucks where floor or spring capacities make it impossible to use heavy fork trucks. It illustrates in simple terms, and with graphic pictures and diagrams, the basic design principles of power fork truck construction. This work fills the need for a fundamental study of the materials handling problems in small and medium-sized plants and offers practical solutions for these problems.

•

Bakelite Vinyl Dispersion Resin QYNV. (Technical Release No. 14). Bakelite Co., 30 East 42nd Street, New York 17, N. Y. 8½ x 11 in. 36 pp.

Data on application technique for low-cost plastisol coatings on wire goods, paper, fabric, foil and electrical assemblies are made available in this new booklet on Bakelite vinyl dispersion resin QYNV. The booklet also describes compounding and production of plastisols based on this resin as well as its general properties. These plastisols are said to provide a durable film coating baked on most materials without the need for expensive equipment or costly solvents. Protective coatings for floor coverings, work gloves, electroplating racks and tool handles are based on this resin because of its unusual resistance to oils, greases, alcohols, acids and alkalies.

•

Dresinate Emulsifiers, Detergents and Dispersions. Paper Makers Chemical Dept., Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 16 pp.

This technical booklet describes the use of "Dresinate" as an emulsifier, detergent and dispersant in soluble oils and cleaning compounds. Dresinate, a series of sodium and potassium salts of various processed rosins and tall oil, is supplied in liquid, dry, and paste form. The booklet includes information about the use of these resinates as emulsifying agents, detergent additives, dispersants, foaming and flotation agents, viscosity-control agents, and industrial sizing compounds. Three tables list the characteristic properties of the liquid, dry, and paste forms. Other tables include typical formulations.

•

Gatke Non-Metallic Products and Moulded Fabric Bearings. Gatke Corp., 228 North La Salle Street, Chicago 1, Ill. 8½ x 11 in. 32 pp.

This brochure illustrates and describes the unique properties of molded fabric bearings, wear plates and other parts. It shows bearings made for grease or oil-lubricated, water-lubricated, unlubricated and acid-resistant services including journal sizes to 48-inch diameter and larger. The brochure also illustrates a great variety of molded asbestos brake blocks, frictions, cones and other shapes. The brochure is profusely illustrated with line drawings and photographs.

•

Vinsol Resin for Adhesives. Naval Stores Department, Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 36 pp.

This new technical booklet includes a wide range of data relative to the use of Vinsol resin as a low-cost component of nitrile rubber, vinyl, and other type adhesives. Product applications discussed are divided into two sections. One covers rubber-base adhesives and the other includes information about the use of Vinsol in vinyl resin adhesives and adhesives based on styrene, phenol, urea-starch, cellulose, and polymerized oil. Vinsol resin is a hard, brittle, high-melting thermoplastic material derived from southern pine wood.

Bondmaster Adhesives for Film, Foil, Fabric and Other Web Laminations. (Manual No. 110). Rubber and Asbestos Corp., 225 Belleville Avenue, Bloomfield, N. J. 8½ x 11 in. 12 pp.

In addition to over forty-five actual photographs of typical laminations, this new booklet features two new charts, reported to be the first of their kind in the adhesives industry. The first of these, a "Master Chart of Laminating Adhesives", lists laminations for twenty-six laminating materials, from aluminum foil and asbestos paper to vinyl film and wood, together with their outstanding properties. The second chart, supported by sixteen clarifying drawings, offers a "Check List of End Use Properties of the Completed Lamination" and provides for the laminator a list of characteristics demanded of the adhesives which are to be specified for such jobs as advertising displays, bandages, metallic threads, decorative laminates, and a host of industrial and consumer packaging laminates.

•

Blending, Processing, and Heat Exchange Equipment. (Bulletin No. 13). Patterson-Kelly Co., Inc., East Stroudsburg, Penna. 8½ x 11 in. 12 pp.

This catalog on blending, processing, and heat exchange equipment for the chemical and processing industries provides photographs and specifications on a variety of sizes and adaptations of the company's three basic types of blenders. Production sizes are available on the ribbon, double cone, and patented twin shell models, and one pint to eight quart laboratory sizes for the twin shell. Process equipment also ranges from small five to fifteen-gallon "packaged" pilot plants and autoclaves to kettles and reactors of 1,000-gallon capacity, with most equipment available in stainless steel. Twenty different cooling and exchange units are shown, with many devoted to specialized applications.

•

Vulcanized Vegetable Oils: Rubber Substitutes. Carter Bell Manufacturing Co., Springfield, N. J. 8½ x 11 in. 8 pp.

This interesting publication states that the choice of a rubber substitute for a given compound depends upon the type of rubber and the property desired in the finished article. Experience shows that no one grade of rubber substitute will perform all the functions that rubber compounders require. A wide variety of vulcanized oil products has been developed and proven to be of value in the diversified rubber industry. The products described in this brochure are said to be the result of long experience and continued research in this field and include such types as vulcanized vegetable oils, white rubber substitutes, brown rubber substitutes and modified brown rubber substitutes.

•

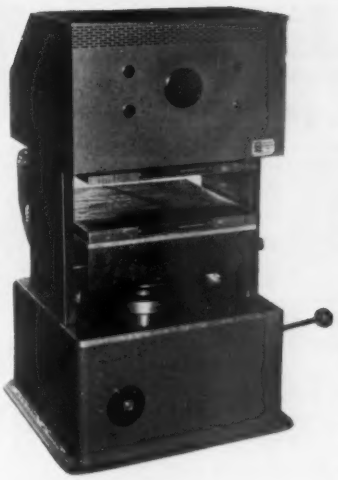
Variable Delivery Pumps. (Bulletin No. 47010). Oilgear Co., 1587 W. Pierce St., Milwaukee 4, Wisc. 8½ x 11 in. 8 pp.

Oilgear type "A" packaged variable delivery pumps for both straight line or rotary drive applications are described in this new bulletin. There are eight different types of standard controls for mounting integral with either side of the pump which are described. Maximum delivery is 1120 cubic inches per minute at 1750 rpm. Maximum continuous working pressure is 1100 psi and peak pressure 1350 psi. J.I.C. circuits of pumps for differential and non-differential systems, symbolic diagrams of straight line and rotary drives and installation dimensions are included.

•

Advance Vinyl Stabilizers. Advance Solvents and Chemical Corp., 245 Fifth Ave., New York 16, N. Y. 8½ x 11 in. 4 pp.

Advance Solvents is said to have pioneered the commercial development of metallic-organic stabilizers for vinyl resins to inhibit degradation by heat and light. To acquaint the reader with this and other company developments in the field of vinyl stabilization, this folder lists and gives brief thumbnail descriptions of the more generally used stabilizers in the Advance line.



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MARKETS

NEWS-PRICES

NEW YORK, NOV. 4, 1954

Natural Rubber

Since our last report (October 6), the average price of spot rubber on the New York Commodity Exchange has moved in a range of 238 points, high for the period being 28.00c reached on November 4, and low being 25.62c reached on October 6. The average price of spot rubber for the month of October was 26.57c based on 20 trading days. This compares with an average of 23.99c in September.

The price of natural rubber continues to climb as new highs were again established during the period under the leadership of London and Singapore. As has been the case for some time, primary centers continue as the dominating influence in shaping price movements.

The trade reports, however, that a more cautious attitude is developing in following price advances. It is generally recognized that the rate of natural rubber consumption in the United States has increased substantially during the past months, due, in all probability to the expansion in tubeless tire production. Nevertheless, it is argued that even with this higher consumption both in the United States and abroad, the price has now reached a level where it will cause some consumer opposition.

Urges More Stable Price

On the matter of natural rubber prices, H. C. Bugbee, president of the Natural Rubber Bureau, has stated that the industry is against either a "runaway price" or an "unsound drop" in prices.

Mr. Bugbee said that foreign producers are not responsible for recent increases which have brought the price of natural about 5c above the price of synthetic rubber. Mr. Bugbee attributed current high prices to "demands of the market place" and said that buyers have created them. He stated that the good underlying factory demand has been a greater factor in the price rise than any unusual speculative element.

Other voices on the question have been heard in Malaya where a producer recently stated that it behooves every grower of natural rubber firstly to plan to produce his crop at a price fully competitive with the likely lowest selling price of synthetic in the future. Secondly, but no less important, the producer should take every step to find out and subsequently to show manufacturers and consumers new methods of processing which will make the natural product once again superior in properties to synthetic for many uses.

GSA Rotation Meetings

The trade is awaiting results of the meetings held recently in Washington on the subject of rotation rubber. Some quarters state that in view of the action taken by GSA some months ago to aid smaller producers by taking steps to lift the price of lower grades, it is unlikely that immediate action will be taken to adversely affect the price structure on the lower grades.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM OCTOBER 6 TO NOVEMBER 4

Oct.	Spot	Dec.	Mar.	May	July	Sales
6	25.62	25.94	25.84	25.80	25.80	88
7	26.25	26.44	26.34	26.25	26.25	116
8	26.25	26.55	26.30	26.30	26.35	126
9	....	....	....	....	....	....
10	....	....	....	....	....	....
11	26.62	26.90	26.75	26.70	26.70	22
12	....	....	....	....	....	....
13	26.75	27.05	26.90	26.80	26.80	58
14	26.88	27.30	27.10	26.95	26.90	74
15	27.00	27.50	27.05	26.90	26.75	92
16	....	....	....	....	....	....
17	....	....	....	....	....	....
18	26.62	26.80	26.50	26.20	26.00	69
19	26.75	27.25	26.85	26.55	26.40	50
20	27.12	27.55	27.15	27.00	26.85	157
21	27.25	27.74	27.28	27.05	26.97	132
22	27.12	27.55	27.10	26.87	26.70	31
23	....	....	....	....	....	....
24	....	....	....	....	....	....
25	27.25	27.65	27.30	27.10	26.90	67
26	27.12	27.50	27.05	26.95	26.75	82
27	27.00	27.50	27.14	26.95	26.70	58
28	26.88	27.10	26.90	26.60	26.45	104
29	26.88	27.15	26.95	26.75	26.60	50
30	....	....	....	....	....	....
31	....	....	....	....	....	....
Nov.						
1	27.38	27.40	27.28	27.15	26.85	48
2	....	....	....	....	....	....
3	27.88	28.00	27.85	27.75	27.60	141
4	28.00	28.05	28.00	27.90	27.60	120

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.28
November	.28
December	.28
Thin Latex Crepe:	
Spot	.31
Thin Brown Crepe, No. 2	.26⅝
Smoked Blankets	
Flat Bark Crepe	.22¾

London Market

(Standard Smoked Sheets)

December	28.73 - 29.02
Jan.-Mar.	27.85 - 27.56

Singapore Market

(Standard Smoked Sheets)

December	26.49 - 26.52

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	2.50 -3.60
G-E Silicone Gum (not compounded)	4.00 -4.20
GR-I	—— - .230
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type S	—— - .420
Neoprene Type W	—— - .410
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Silastic (compounded)	1.95 - .338
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	Oct. 6	November 4		
	Close	High	Low	Close
Dec.	34.99	34.40	34.28	34.28
Mar.	35.26	34.77	34.66	34.66
May	35.49	35.06	34.94	34.94

Synthetic Rubber

It may be gathered from current reports that the Rubber Producing Facilities Disposal Commission is taking a firm attitude with reference to bidders for the government-owned synthetic rubber plants. Elsewhere in this issue there appears a report that three plant bidders have just about met terms set down by the Commission for plant purchases, and the trade believes that a fourth bidder may soon join this group.

With these relatively firm bids, some in the trade believe that the Commission is now ready to tell certain other bidders to get their offers above the "bargain" level or prepare for a sideline seat while the government puts plants they sought into mothballs.

The Commission is believed to have set price tags on each plant, relating these to earning power among other factors. At any rate, all bidders by now know whether or not they are within sight of the prices considered realistic by the Commission.

Although the $300,000,000 sales price mentioned by some experts may not be reached, it seems certain that Congress will not sanction any bargain arrangements. The final total sale price will depend largely on how many facilities are sold as opposed to how many are put in mothballs. Some of the high cost facilities are not considered attractive by many in the trade.

Some suggestion as to what may be expected may come from Holman D. Pettibone, Chairman of the Disposal Commission, when he addresses a meeting of the Rubber Manufacturers Association in New York City on November 18. All plant bidders and top members of the House and Senate committees passing on rubber disposal have been invited.

Statistical Position

More than a little confusion exists in the trade relative to the statistical position of synthetic rubber and natural rubber. Latest estimates by the Federal Facilities Corporation indicate that GR-S production in 1954, including the oil content, will be approximately 470,000 long tons and total sales will approximate 488,000 long tons.

It would normally be expected that with natural prices almost five cents above synthetic prices, more synthetic would be consumed. This has not been the case, however. GR-S production in 1954 will fall short of production in the previous year by some 200,000 tons.

It is believed by some that even with this picture in mind, manufacturers will continue to buy natural actively for some time to come. It should be understood, they state, that a changeover from natural to synthetic or vice-versa is a slow process. Inevitably, however, a changeover will occur, they believe, restoring the market to its proper historical perspective.

Prospects for Recovery

Others in the trade, however, are not too sanguine about prospects for an immediate recovery for synthetic rubber. One point quoted is that there are intimations that production of tubeless tires requires, or at least makes desirable, the use of greater quantities of natural. If this is so, and in consideration of the fact that most new automobiles will be equipped with tubeless tires, proportionate use of natural and synthetic may continue in the pattern which has been established in the last six months for the next six months.

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MARKETS NEWS-PRICES

NEW YORK, NOV. 4, 1954

Reclaimed Rubber

According to reports from the trade, consumption of reclaimed rubber, which depends in great part on automobile production, has been low during the period of model changeover. However, indicated production of 1955 automobiles, along with the rise in price of natural rubber, suggests increasing reclaim consumption in November.

Butyl reclaim is said to be in demand for the manufacture of tubeless tires. Non-staining reclaims are also being specified by an increasing number of rubber manufacturers. Reclaimers report firmer scrap prices, as is usual during a rising rubber market when collectors are inclined to hold on to their scrap in hope of higher prices. There have been no changes in reclaim prices during the past period.

Reclaim consumption in the first eight months of this year is estimated at about 163,000 long tons by the Department of Commerce.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.12½
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

During the past period, the scrap rubber market has exhibited greater activity than it has for some months past. Scrap dealers report that reclaimers are showing more interest in acquiring scrap, a condition which usually develops at this time of year. Business has picked up in mixed automobile tires and trading in tubes has also been on the upgrade.

The U. S. Commerce Department reports that 2,486,759 pounds of scrap rubber were exported in July, valued at $67,227. Scrap exports in June totaled 2,003,675 pounds valued at $59,586, while in May of this year 1,797,580 pounds valued at $47,122 were exported indicating, to some extent, a rising market for this portion of the industry.

(Prices Delivered Akron)

Mixed tires	ton	13.50
Light colored carcass	lb.	.05½
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	17.00
Truck and Bus S.A.G.	ton	17.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.08
Natural Rubber Black Tubes	lb.	.05¾
Butyl Rubber Tubes	lb.	.03¼

Tire Fabrics

An indication of current activities in tire fabrics may be perceived from various widely separated but nevertheless related new happenings of the past period.

(1) J. E. Bassill, president of the American Enka Corp., recently noted that with the settlements of strikes in the tire industry, tire yarn sales have improved and are expected to reach better levels during the remaining weeks of 1954.

(2) Benjamin Wood, director of the American Rayon Institute, in an address before the National Association of Independent Tire Dealers in Chicago, Ill., noted that nine out of ten tires produced today are made with rayon cord. Mr. Wood said that the rayon industry led the way in cord construction, making possible many of the advances in modern tire design and use. The result has been safer, stronger, and longer-wearing tires for the nation's automobile, truck and tractor tire consumer, he declared.

(3) A rayon yarn of super-strength and improved fatigue characteristics is now in commercial production at the Front Royal, Va., plant of the American Viscose Corp. The new yarn, which will be identified by the trade name "Super Rayflex", will ultimately replace the improved type yarn currently manufactured by the company.

Super Rayflex is currently available in 1650 denier. Within a year it is expected that all production facilities of the corporation's plants at Front Royal and Lewiston, Penna., currently assigned to tire yarn spinning, will be converted to the new yarn.

(4) DuPont reports a nine-fold increase in the number of nylon cord passenger tire brands on the market now, as compared with one year ago. This indicates, the company believes, the widespread acceptance of nylon in the tire industry.

DuPont reports that the following companies are now using nylon tire cords in their leading passenger tire lines: Armstrong Rubber, Dayton Rubber, Denman Rubber Manufacturing, Dunlop Tire, Firestone, Gates Rubber, General Tire, Goodyear, Kelly-Springfield, Mansfield Tire, Seiberling Rubber, and U. S. Rubber.

(5) Industrial Rayon Corp. reports that during the third quarter of 1954, conversion of its tire yarn production facilities to an improved type of rayon for tires was completed.

(6) Celanese Corp. is preparing to launch "X-36", a liquid-treated acetate yarn, into the tire market battle, according to recent reports. Celanese officials believe that the new fiber will have a wide variety of other industrial uses such as in conveyor belts, V-belts and fire hose.

(7) North American Rayon Corp. has introduced a new, improved type of rayon tire yarn into the market.

(8) The Textile Economics Bureau reports that shipments for the tire and related users trade have been declining since the third quarter of last year.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord		
1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73
Nylon Tire Cord		
210	lb.	2.00
840	lb.	2.00
Rayon Graded Fabric		
1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½
Cotton Chafers		
14.4 oz. (per square yard)	lb.	.74
9.25 oz. (per square yard	lb.	.69½
11.65 oz. (per square yard)	lb.	.66
8.9 oz. (per square yard)	lb.	.71

Liquid Latex

Natural: According to Latex and Rubber, Inc., the past few weeks of the Hevea latex market have been characterized by the (a) drying up of all offerings from factories liquidating surpluses, and (b) steadily increasing prices. Most current prices for U.S. bulk latices have hovered in the range of 34¾ to 35½c.

At this writing, there do not seem to be any surplus quantities of prime quality concentrated latex which are causing distress. There is no evidence of any primary importer or consumer being unable, by reason of lack of storage space or other fiscal reasons, to handle their position. As recently as September, overloaded consumers were placing large quantities of latex on the market at prices of 31½ and 32c, then about 2c below market value.

Synthetic: It is believed by some in the trade that production of GR-S latex in October and November will show a marked increase. The price is said to be attractive and all latex consumption will be on the increase during the period. U. S. prices for GR-S latices currently range from 21½ to 28c per pound total dry solids in tank cars, f.o.b. works; a uniform freight charge of 1.1c per pound net weight charge by FFC pays the freight to the buyer's destination within the U. S.

The U. S. Commerce Department reports that in the first eight months of the current year, 28,491 long tons of GR-S latex were produced and 27,113 long tons consumed. In the first eight months of the preceding year, 31,683 long tons of GR-S latex were produced and 32,170 long tons consumed.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in a rather narrow range of 65 points since our last report (October 6), high for the period being 35.50c reached on October 6, 10 and 13, and low being 34.85c reached on November 4. The average price of middling uplands for the month of October was 35.24c based on 20 trading days. This compares with an average of 35.46c in September.

According to *Textile Organon*, world production of cotton during the 1953-54 season was 35,600,000 bales, an increase of 1,200,000 bales over the 1952 season figure and the highest since 1937-38, when production aggregated 36,700,000 bales.

Since the carryover from the 1952-53 season was 16,400,000 bales, the total available supply during the season was 52,000,000 bales or 3,300,000 bales greater than the comparable figure for the previous season.

World production of cotton exceeded consumption for the third consecutive season and the total carryover at the end of the crop year rose to 18,700,000 bales, the highest since the 1945 season-ending carryover of 23,000,000 bales. As yet, there are no data available on estimated world output of cotton during the 1954-55 crop year.

Exports of American cotton, which fell off sharply to 3,000,000 bales in the 1952-53 season, recovered to 3,800,000 bales in the season which closed last July 31. Even so, and with the exception of 1952, the 1953 American export total was the lowest for any season since 1947-48 when domestic shortages and export controls combined to hold cotton shipment abroad to the abnormally low figure of 2,000,000 bales.

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VULCACURE NB
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Los Angeles 58, Cal.

STATISTICS

of interest to the rubber industry

Natural Rubber in the United States

(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1925	400,423	388,500	14,827	51,215
1926	417,643	366,200	17,671	72,510
1927	431,246	373,000	27,775	99,282
1928	439,731	437,000	32,159	65,454
1929	565,087	467,400	36,485	118,609
1930	487,628	376,000	30,205	201,000
1931	501,788	355,200	25,609	322,000
1932	414,668	336,700	20,937	379,000
1933	418,902	412,400	20,576	365,000
1934	463,018	462,500	23,856	355,000
1935	467,146	495,500	11,391	303,000
1936	488,145	575,000	12,582	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1952	805,997	453,846	3,024	95,260
1953	647,150	553,473	8,376	112,316
1953:				
Dec.	45,947	42,400	923	112,316
1954:				
Jan.	47,140	46,960	648	112,679
Feb.	42,645	46,897	638	115,228
Mar.	47,721	53,709	460	112,829
Apr.	49,855	51,451	918	106,564
May	55,983	51,398	355	104,377
June	66,698	54,253	524	104,541
July	40,614	39,894	565	109,564
Aug.	.....	37,831	545	124,984

Source: U. S. Department of Commerce.

U. S. Imports of Natural Rubber

Year	Dry: Long Tons	Dry: Declared Value	Latex: Long Tons	Latex: Declared Value	Total Imports
1937	574,600	237,307,041	23,185	10,213,670	597,785
1938	397,640	125,373,864	11,944	4,168,127	409,584
1939	469,946	167,586,780	27,437	10,467,552	497,383
1940	781,202	303,308,823	33,789	14,593,466	814,991
1941	989,498	401,976,317	34,797	15,965,627	1,024,245
1942	266,276	112,537,426	10,646	5,630,667	276,922
1943	50,358	31,369,198	1,890	1,312,202	52,248
1944	103,847	73,908,549	3,091	2,092,211	106,938
1945	134,408	95,814,102	4,773	3,115,853	139,181
1946	376,502	228,796,110	8,421	5,843,085	384,923
1947	691,087	306,951,814	17,542	9,787,722	708,629
1948	702,293	290,849,177	32,745	18,288,223	735,038
1949	630,808	225,343,624	29,743	14,968,650	660,551
1950	747,109	416,222,598	54,401	41,764,486	801,510
1951	677,874	727,343,348	54,963	80,178,309	732,837
1952	756,987	578,179,519	48,228	40,563,116	805,215
1953	571,635	284,909,223	75,511	46,353,333	647,146
1953:					
Nov.	44,917	20,555,812	4,826	2,621,299	49,743
Dec.	38,779	15,883,810	7,169	3,819,828	45,948
1954:					
Jan.	41,744	15,981,655	5,396	2,696,694	47,140
Feb.	36,964	14,148,159	5,681	2,931,860	42,645
Mar.	42,039	15,823,475	5,682	3,031,963	47,721
Apr.	44,193	16,605,910	5,663	2,855,180	49,856
May	52,177	19,493,956	3,806	1,907,249	55,983
June	60,108	23,432,566	6,590	3,515,531	66,698
July	35,334	14,694,340	5,236	2,915,484	40,570

Source: Bureau of the Census, U. S. Department of Commerce.

World Production of Natural Rubber

(Including Latex)

(Long Tons)

Year	Malaya	Indonesia	Ceylon	Viet Nam & Cambodia	Latin America	Rest of World*	Total*
1942	155,000*	200,000*	101,500	76,177	35,794	71,476	640,000
1943	75,000*	100,000*	105,500	70,370	41,900	72,507	465,000
1944	25,000*	50,000*	98,500	60,419	49,946	77,002	360,000
1945	8,600*	10,000*	97,500	12,000*	47,125	73,570	250,000
1946	403,719	175,000*	94,000	19,975	39,678*	105,080	837,500
1947	646,362	277,951	89,000	38,128	34,928*	172,792	1,260,000
1948	698,189	432,349	95,000	43,935	29,158*	226,056	1,525,000
1949	671,503	432,996	89,500	43,010	27,318*	225,907	1,490,000
1950	694,090	696,472	113,500	48,482	26,902*	279,541	1,860,000
1951	605,346	814,406	105,000	52,136	29,777*	277,716	1,885,000
1952	584,238	749,241	96,500	63,134	35,475*	260,111	1,790,000
1953	574,390	692,164	98,610	74,545	35,318*	249,644	1,725,000
1953:							
Dec.	52,600	64,398	12,718	10,156	2,932*	22,875	165,000
1954:							
Jan.	49,424	59,092	10,008	7,958	3,519*	22,717	152,500
Feb.	43,366	53,276	6,333	1,234	2,367*	20,246	127,500
Mar.	42,130	59,875	4,540	3,119	2,442*	25,309	137,500
Apr.	40,223	58,170	7,246	4,437	2,975*	19,338	132,500
May	46,285	55,719	5,296	5,738	2,397*	17,707	132,500
June	43,202	54,594	7,713	6,232	500*	23,009	137,500
July	54,068	72,979	8,014	....	500*	16,294	165,000

Source: International Rubber Study Group. * Estimated.

World Consumption of Natural and Synthetic Rubber

(Including Latex)

(Long Tons)

Year	United States	United Kingdom	Canada	Europe*	Rest of World*	Total*
1943	488,525	66,730	32,896	150,000	156,104	907,500
1944	710,783	86,977	34,310	132,500	160,690	1,125,000
1945	799,009	91,047	41,836	87,500	108,164	1,127,500
1946	1,039,296	126,770	39,196	145,000	115,804	1,467,500
1947	1,122,327	156,399	61,452	242,500	153,548	1,735,000
1948	1,069,404	196,286	62,121	392,000	182,379	1,902,500
1949	988,903	186,622	56,362	446,500	207,388	1,887,500
1950	1,258,557	222,425	68,695	448,500	287,055	2,285,000
1951	1,214,298	238,101	70,809	476,500	314,941	2,312,500
1952	1,261,413	202,179	67,099	550,000	254,901	2,335,000
1953	1,338,309	211,453	73,394	520,750	343,606	2,487,500
1953:						
Nov.	96,132	20,621	6,237	56,250	30,013	210,000
Dec.	93,511	17,411	6,127	40,500	30,123	187,500
1954:						
Jan.	97,133	20,862	5,643	41,750	33,557	200,000
Feb.	95,957	17,985	6,564	45,250	26,656	192,500
Mar.	109,769	19,796	6,519	46,500	30,481	212,500
Apr.	105,105	20,432	5,972	41,750	42,278	215,000
May	104,026	19,523	6,202	41,500	27,798	197,500
June	111,448	18,713	6,461	39,250	28,039	205,000
July	78,974	18,294	4,758	40,750	26,242	107,000

Source: International Rubber Study Group. * Estimated.

U. S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

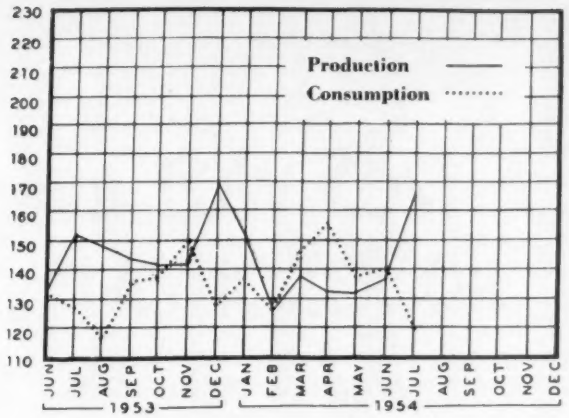
Year	Balata: Tons	Balata: Value	Jelutong: Tons	Jelutong: Value	Gutta-Percha & Other Guttas: Tons	Gutta-Percha & Other Guttas: Value
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1952	988	762,994	1,636	2,094,983	282	385,890
1953	1,619	866,248	1,027	1,166,837	235	303,116
1953:						
Oct.	50	23,033	101	110,166	10	18,363
Nov.	107	56,544	73	77,496	19	31,834
Dec.	342	148,582	56	55,136	60	33,175
1954:						
Jan.	61	30,769	74	60,746	9	23,425
Feb.	44	18,583	98	88,964	33	28,464
Mar.	19	22,053	59	73,541	19	17,213
Apr.	131	64,025	226	312,654	54	45,733
May	90	35,350	192	232,496	27	37,329
June	87	36,745	318	392,687	97	126,979
July	104	54,957	201	240,477	24	37,749

Source: U. S. Department of Commerce.

STATISTICS at a glance

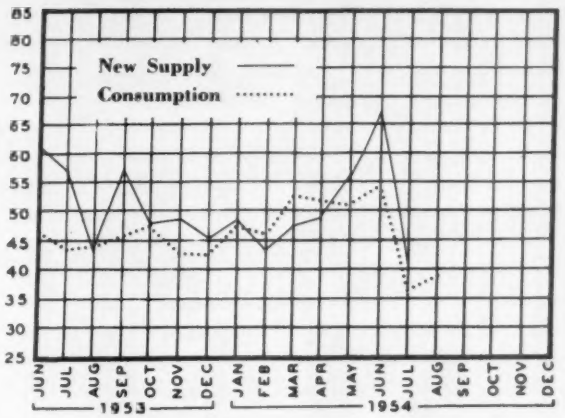
NATURAL RUBBER—WORLD

(thousands of long tons)



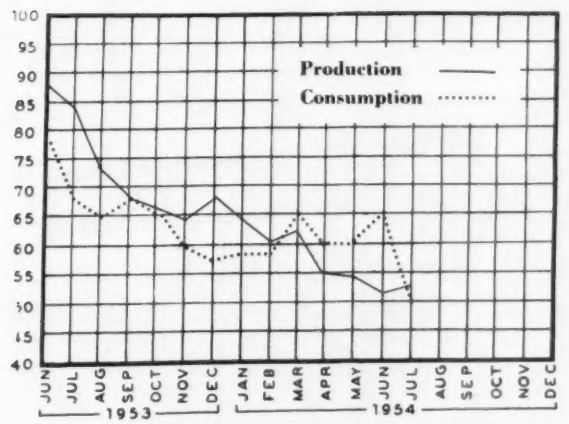
NATURAL RUBBER—UNITED STATES

(thousands of long tons)



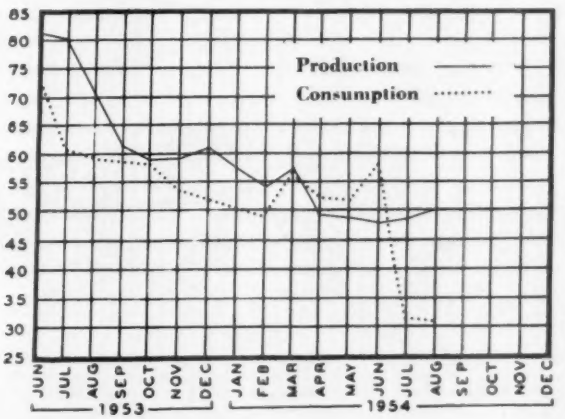
SYNTHETIC RUBBER—WORLD

(thousands of long tons)



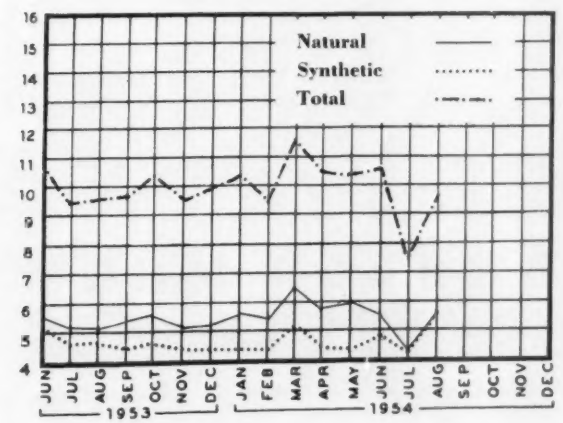
SYNTHETIC RUBBER—UNITED STATES

(thousands of long tons)



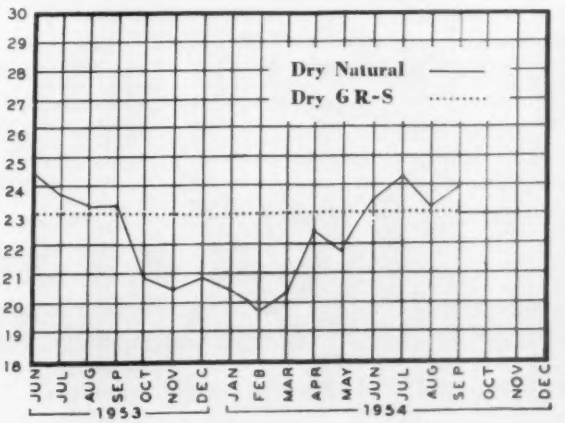
LATEX CONSUMPTION IN THE U. S.

(thousands of long tons)



PRICES—NATURAL AND SYNTHETIC

(cents per pound)



Synthetic Rubber in the United States

(All Quantities in Long Tons)

New Supply

Year	GR-S	Neoprene	Butyl	N-Type	Total
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,539	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,529	58,907	76,475	15,333	855,244
1952	654,854	65,745	81,630	16,228	818,447
1953	680,728	80,495	79,801	20,198	861,222
1953:					
Dec.	45,902	6,990	6,057	1,459	60,408
1954:					
Jan.	44,377	6,513	5,539	1,620	58,049
Feb.	41,691	6,206	4,801	1,574	54,272
Mar.	44,464	5,190	5,214	1,900	56,768
Apr.	35,551	5,601	6,004	1,645	48,801
May	36,237	4,828	4,581	1,960	47,606
June	37,092	5,101	3,182	1,696	47,071
July	36,803	4,673	4,960	1,814	48,250
Aug.	38,069	5,313	5,003	1,624	50,009

Consumption

1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897
1952	666,420	55,522	71,229	13,866	807,037
1953	624,181	65,900	77,826	16,929	784,836
1953:					
Dec.	40,018	4,836	4,808	1,240	50,902
1954:					
Jan.	38,689	4,774	5,438	1,272	50,173
Feb.	37,707	4,467	5,696	1,190	49,060
Mar.	43,136	5,177	6,300	1,447	56,060
Apr.	41,324	4,694	6,241	1,395	53,654
May	41,174	4,486	5,602	1,366	52,628
June	44,974	4,769	5,961	1,491	57,195
July	32,800	3,499	4,108	1,145	41,552
Aug.	31,564	4,406	3,494	1,307	40,771

Exports

1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249
1952	9,467	9,813	126	2,695	22,101
1953	7,692	11,494	237	3,245	22,668
1953:					
Dec.	791	1,416	6	414	2,627
1954:					
Jan.	618	434	0	295	1,347
Feb.	508	1,251	2	287	2,048
Mar.	1,265	930	416	288	2,899
Apr.	520	1,296	62	454	2,332
May	1,115	844	373	395	2,727
June	881	694	216	215	2,006
July	1,126	1,220	421	358	3,125
Aug.	1,004	957	318	286	2,565

Stocks

1945	170,571	9,703	18,378	4,802	203,454
1946	81,493	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,821	129,912
1952	83,861	8,535	22,716	3,875	118,987
1953	135,153	11,480	24,866	4,346	175,845
1953:					
Dec.	135,153	11,480	24,866	4,346	175,845
1954:					
Jan.	138,692	13,065	24,733	4,349	180,839
Feb.	143,202	12,518	23,573	4,112	183,405
Mar.	145,178	12,575	22,329	4,202	184,284
Apr.	136,446	12,665	21,673	4,199	174,983
May	131,604	11,467	20,077	4,435	167,583
June	124,678	10,646	17,534	4,314	157,172
July	128,752	11,315	18,150	4,727	162,944
Aug.	135,461	10,902	19,642	4,704	170,709

Source: U. S. Department of Commerce.

Natural and Synthetic Rubber Latex in the United States

(All Quantities in Long Tons)

New Supply

Year	Natural	GR-S	Neoprene	N-Type	Total Synthetic	Grand Total
1942	9,595	.....	210	.....	210	9,805
1943	1,890	194	1,512	.....	1,706	3,596
1944	3,090	6,580	4,683	.....	11,263	14,353
1945	4,768	15,176	7,077	.....	22,253	27,021
1946	8,012	24,810	13,595	.....	38,405	46,417
1947	17,675	22,474	6,089	.....	28,563	46,238
1948	32,630	21,494	5,022	.....	26,516	59,146
1949	29,974	21,357	3,651	.....	25,008	54,982
1950	54,401	31,339	5,725	.....	37,064	91,465
1951	54,963	32,972	6,866	2,948	42,786	97,749
1952	48,228	42,273	7,598	4,164	54,035	102,263
1953	75,511	48,112	9,026	5,844	62,982	138,493
1953:						
Aug.	6,649	3,149	753	633	4,535	11,184
Sept.	6,127	3,518	778	582	4,878	11,005
Oct.	6,537	3,654	753	733	5,140	11,677
Nov.	4,826	3,715	754	352	4,821	9,647
Dec.	7,168	3,900	636	490	5,026	17,220
1954:						
Jan.	5,396	4,089	592	471	5,152	10,548
Feb.	5,681	3,928	742	375	5,045	10,726
Mar.	5,682	4,142	709	483	5,324	11,006
Apr.	5,663	4,046	803	461	5,310	10,973
May	3,806	3,838	680	623	5,141	8,947
June	6,590	4,019	620	585	5,224	11,814
July	5,236	2,589	448	643	3,680	8,916
Aug.	....	1,995	756	682	3,433	.....

Consumption[1]

1942	9,392	.....	200	....	200	9,592
1943	9,578	150	1,400	....	1,550	11,128
1944	6,085	6,000	4,400	....	10,400	16,485
1945	3,886	14,500	6,800	....	21,300	25,186
1946	5,714	23,500	13,000	....	36,500	42,214
1947	13,909	22,500	6,500	....	29,000	42,909
1948	28,489	21,500	5,250	....	26,750	55,239
1949	36,117	21,500	3,750	....	25,250	61,367
1950	56,138	31,000	5,500	....	36,500	92,638
1951	46,750	31,031	6,279	2,628	39,938	86,688
1952	53,567	40,562	7,368	3,093	51,023	104,590
1953	67,375	46,473	7,981	3,654	58,108	125,483
1953:						
Aug.	5,203	3,576	670	343	4,641	9,832
Sept.	5,504	3,599	678	166	4,443	9,947
Oct.	5,897	3,719	660	312	4,563	10,460
Nov.	5,234	3,510	553	244	4,307	9,541
Dec.	5,395	3,475	574	277	4,344	9,739
1954:						
Jan.	5,882	3,475	615	275	4,365	10,247
Feb.	5,595	3,568	575	250	4,393	9,988
Mar.	6,610	3,982	729	335	5,046	11,656
Apr.	5,892	3,748	603	324	4,675	10,567
May	5,969	3,394	586	348	4,328	10,297
June	5,884	3,653	629	402	4,684	10,568
July	4,298	2,587	482	296	3,365	7,663
Aug.	5,620	2,706	503	324	3,533	9,153

Stocks at End of Period

1942	13,450	....	....	....	....	13,450
1943	5,638	....	....	....	....	5,638
1944	2,443	....	....	....	....	2,443
1945	3,121	....	....	....	....	3,121
1946	4,865	....	....	....	....	4,865
1947	5,033	....	....	....	....	5,033
1948	11,235	....	....	....	....	11,235
1949	5,063	....	....	....	....	5,063
1950	4,927	....	....	....	....	4,927
1951	4,752	3,727	1,245	532	5,504	10,256
1952	6,201	5,040	1,019	902	6,961	13,162
1953	13,532	4,794	1,117	721	6,632	20,164
1953:						
Aug.	10,273	5,081	1,127	617	6,946	17,992
Sept.	11,370	4,794	1,122	638	6,554	17,924
Oct.	11,126	4,990	1,133	737	6,868	17,986
Nov.	10,834	4,533	1,064	743	6,340	17,174
Dec.	13,532	4,794	1,117	721	6,632	20,164
1954:						
Jan.	12,375	5,001	1,019	703	6,723	19,098
Feb.	12,963	5,269	963	625	6,857	19,820
Mar.	11,870	5,247	975	588	6,810	18,680
Apr.	10,803	5,273	1,062	600	6,935	17,738
May	8,907	5,180	1,110	655	6,945	15,852
June	9,460	5,591	1,020	646	7,257	16,717
July	10,171	5,363	1,004	831	7,198	17,369
Aug.	12,175	4,355	1,010	1,014	6,379	18,554

Source: U. S. Department of Commerce.
Note: (1) GR-S and Neoprene consumption estimated through 1950.

HYDROCARBON

PANAFLEX ...EP-1

PLASTICIZERS

A LOW COST PLASTICIZER OIL

for Rubber Compounding

PROPERTIES

Low Specific Gravity — Dark Viscous Liquid
Extremely High Boiling

FOR

Improved Processing — Improved Electrical
Minimum Effect on Cure — Characteristics
Extending Vulcanizates — Better Tear Resistance

EXCELLENT COMPATIBILITY WITH

GR-S Rubbers—All Types — Buna N Type Rubbers
Neoprene Rubber

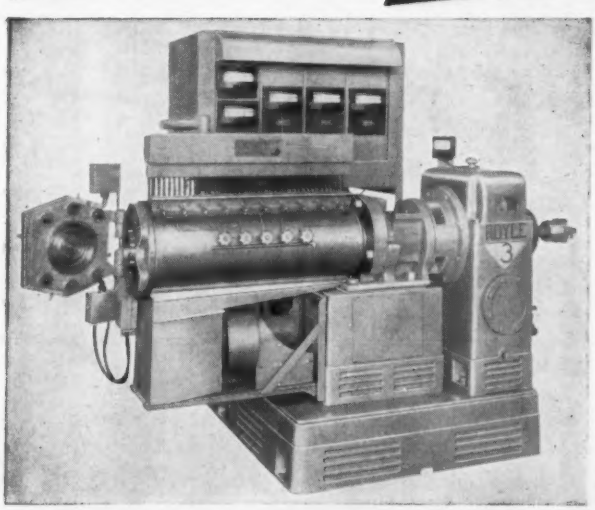
AVAILABILITY

Basic Producer — Tank Car or Drums
Warehouse Distribution

PAN AMERICAN CHEMICALS

PAN AMERICAN *Chemicals*
DIVISION
Pan American Refining Corp.
122 EAST 42ND STREET · NEW YORK 17, N. Y.

FASTEST HEATING FASTEST COOLING



Here are some of the time-tested, money-saving reasons more and more plants are standardizing with Royle Spirod* Extruders for processes requiring maximum flexibility in controlled temperatures — constantly maintained and accurately zoned:

- **Extra heavy walled cast steel cylinders that will not warp. No joints to leak when pressures are high or crevices to collect burned compound that would cause contamination.**
- **Heavy duty large diameter heating elements, that can be used with 440 volts without step-down transformers, provide radiant heat to cylinders and heads.**
- **Any heating element may be removed and replaced without disturbing other elements or wiring.**
- **A cooling system with ten times the capacity of conventional designs can be modulated through its entire temperature range without drastic changes. Ample cooling for all compounds at maximum speeds.**

No. 3 Royle Spirod Extruder. Completely insulated and equipped for evaporative cooling.

*Patent Applied For

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — REgent 2430
Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262
Akron, Ohio — J. C. Clinefelter — SWandale 4-5020
Los Angeles, Cal. — H. M. Royal, Inc. — LOgan 3261

PATERSON 3, NEW JERSEY

Rubber Industry Employment Earnings and Hours

All Rubber Products

Mo.	1953 Production Workers (thousands)	1953 Average Weekly Earnings	1953 Average Weekly Hours	1953 Average Hourly Earnings	1954 Production Workers (thousands)	1954 Average Weekly Earnings	1954 Average Weekly Hours	1954 Average Hourly Earnings
Jan.	219.2	$78.09	41.1	$1.90	205.7	75.08	38.7	1.94
Feb.	219.2	79.30	41.3	1.92	202.9	75.47	38.9	1.94
Mar.	220.5	80.29	41.6	1.93	199.4	74.31	38.5	1.93
Apr.	226.3	79.32	41.1	1.93	195.2	75.08	38.7	1.94
May	226.2	78.59	40.3	1.95	197.0	77.81	39.7	1.96
June	226.5	78.55	40.7	1.93	198.4	79.60	40.2	1.98
July	219.3	78.98	40.5	1.95	173.3	77.03	39.5	1.95
Aug.	220.7	77.21	39.8	1.94	174.3	....	....	....
Sept.	220.6	74.88	39.0	1.92	....	....	....	....
Oct.	215.6	75.07	39.1	1.92	....	....	....	....
Nov.	210.0	75.65	39.4	1.92	....	....	....	....
Dec.	208.7	75.66	39.2	1.93	....	....	....	....

Tires and Tubes

Jan.	91.5	89.24	40.2	2.22	86.4	82.88	37.5	2.21
Feb.	91.2	91.80	40.8	2.25	85.3	83.03	37.4	2.22
Mar.	91.6	93.83	41.7	2.25	84.7	80.89	36.6	2.21
Apr.	95.6	91.58	40.7	2.25	83.2	84.14	37.9	2.22
May	96.2	91.30	40.4	2.26	83.9	88.65	39.4	2.25
June	96.0	89.20	40.0	2.23	85.0	92.06	40.2	2.29
July	93.7	90.45	40.2	2.25	67.0	87.46	38.7	2.26
Aug.	93.3	87.58	39.1	2.24	....	....	....	....
Sept.	93.4	83.54	37.8	2.21	....	....	....	....
Oct.	90.3	83.16	37.8	2.20	....	....	....	....
Nov.	87.3	85.09	38.5	2.21	....	....	....	....
Dec.	86.7	82.43	37.3	2.21	....	....	....	....

Rubber Footwear

Jan.	24.5	64.96	40.1	1.62	21.5	62.98	38.4	1.64
Feb.	24.2	67.57	41.2	1.64	20.5	65.57	39.5	1.66
Mar.	24.2	67.57	41.2	1.64	19.6	65.51	39.7	1.65
Apr.	23.8	67.82	41.1	1.65	19.2	63.58	38.3	1.66
May	23.3	60.31	37.0	1.63	19.8	65.46	39.2	1.67
June	23.5	68.06	41.0	1.66	19.8	67.30	40.3	1.67
July	22.5	68.64	41.1	1.67	20.1	68.45	40.5	1.69
Aug.	23.6	65.53	40.2	1.63	....	....	....	....
Sept.	24.1	64.24	39.9	1.61	....	....	....	....
Oct.	24.0	62.86	38.8	1.62	....	....	....	....
Nov.	23.7	63.57	39.0	1.63	....	....	....	....
Dec.	22.9	65.44	39.9	1.64	....	....	....	....

All Other Rubber Products

Jan.	103.2	71.74	42.2	1.70	97.8	70.62	39.9	1.77
Feb.	103.8	71.06	41.8	1.70	97.1	70.40	40.0	1.76
Mar.	104.7	71.72	41.7	1.72	95.1	70.22	39.9	1.76
Apr.	106.9	71.21	41.4	1.72	92.8	69.30	39.6	1.75
May	106.7	70.93	41.0	1.73	93.3	70.98	40.1	1.77
June	107.0	71.28	41.2	1.73	93.6	70.98	40.1	1.77
July	103.1	70.64	40.6	1.74	86.2	70.45	39.8	1.77
Aug.	103.8	70.30	40.4	1.74	....	....	....	....
Sept.	103.1	69.65	39.8	1.75	....	....	....	....
Oct.	101.3	70.70	40.4	1.75	....	....	....	....
Nov.	99.0	70.53	40.3	1.75	....	....	....	....
Dec.	99.1	72.45	40.7	1.78	....	....	....	....

Source: U. S. Department of Labor.
Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who work during, or received pay for, any part of the pay period ending nearest the 15th of the month. These employment series have been adjusted to first quarter 1951 benchmark levels indicated by data from government social insurance programs. Hours and earnings data pertain only to production and related workers.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	32.58	36.09	33.37	31.89	45.04	42.96	33.24	34.15
Feb.	33.91	33.63	33 41	32.79	(a)	41.64	33.76	35.00
Mar.	35.89	35.04	33.44	32.65	46.06	41.70	34.10	35.23
Apr.	35.89	38.10	33.84	33.23	46.06	41.79	33.85	35.22
May	36.51	38.57	33.73	33.64	46.06	39.68	34.30	35.34
June	37.83	38.12	33.56	34.61	46.06	41.31	34.11	35.17
July	38.03	34.89	32.99	38.11	46.21	40.37	34.20	35.37
Aug.	34.83	32.23	32.06	38.93	35.93	40.42	33.82	35.19
Sept.	32.21	31.92	30.94	41.62	36.20	39.75	33.69	35.46
Oct.	32.39	32.01	30.32	40.66	38.13	37.52	33.53	35.24
Nov.	34.50	32.15	30.52	43.11	42.70	35.59	33.60	....
Dec.	36.74	32.90	31.08	42.37	43 32	33.76	33.52	....
Average for Year	35.11	34.64	32.44	37.05	42.43	39.71	33.81	....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Production Index for the Rubber Industry

(1947-1949 = 100)

(Based on man-hours)

	1952	1953	1954		1952	1953	1954
Jan.	116	132	114	July	92	114	85
Feb.	119	140	114	Aug.	109	122	92
Mar.	120	143	118	Sept.	118	122	....
Apr.	114	140	116	Oct.	131	127	....
May	111	137	118	Nov.	129	120	....
June	115	131	121	Dec.	123	111	....

Sales by the Rubber Industry

(in Millions of Dollars*)

	1952	1953	1954		1952	1953	1954
Jan.	408	424	348	July	377	448	374
Feb.	402	435	351	Aug.	388	409	....
Mar.	400	473	388	Sept.	427	416	....
Apr.	407	444	375	Oct.	423	395	....
May	402	422	357	Nov.	383	346	....
June	409	436	377	Dec.	418	369	....

Rubber Manufacturers' Inventories

(in Millions of Dollars*)

	1952	1953	1954		1952	1953	1954
Jan.	809	866	844	July	890	925	784
Feb.	842	868	857	Aug.	877	897	....
Mar.	857	880	849	Sept.	871	908	....
Apr.	850	874	812	Oct.	866	881	....
May	855	888	810	Nov.	850	867	....
June	851	914	829	Dec.	877	868	....

Source: U. S. Department of Commerce.
Notes: * Adjusted for seasonal variation.

No. 1 R.S.S.—Annual Average Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1912	140	108	121.60	1933	9⅞	2⅞	5.96
1913	113	59	82.04	1934	15¾	8¾	12.92
1914	93	56	65.33	1935	13¾	10½	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26⅞	14	19.39
1917	90	52	72.23	1938	17⅞	10¼	14.64
1918	70	40	60.15	1939	24	14⅛	17.57
1919	57	38½	48.70	1940	24	18¼	20.10
1920	56½	16	36.30	1941	24⅞	19⅛	22.40
1921	21¼	11½	16.36	1942	22½	22½	22.50
1922	28⅜	13⅝	17.50	1943	22½	22½	22.50
1923	37⅛	24¾	29.45	1944	22½	22½	22.50
1924	40⅞	17⅜	26.20	1945	22½	22½	22.50
1925	121	34⅜	72.46	1946	22½	22½	22.50
1926	88½	36¾	48.50	1947	25	14	20.00
1927	41¾	33	37.72	1948	25	18	21.99
1928	41¼	17	22.48	1949	19¾	15⅞	17.57
1929	26⅞	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)
1931	8⅝	4¼	6.17	1952*	33	26½	29.15
1932	4¾	2½	3.49	1953	31⅞	19⅞	24.21

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

No. 1 R.S.S.—Monthly Average Prices

(New York Market—Cents per pound)

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	22.50 (b)	21.83	19.23	18.33	71.21	....	29.40	20.22
Feb.	25.75 (b)	20.42	18.49	19.40	73.61	....	27.57	19.98
Mar.	25.75 (b)	20.33	19.08	19.86	72.05	....	26.59	20.16
Apr.	25.75 (b)	22.87	18.53	23.51	....	....	24.66	22.06
May	21.04	23.39	17.92	28.07	....	....	25.52	21.96
June	16.29	22.80	16.36	30.92	....	....	24.42	23.01
July	15.48	24.24	16.45	39.10	....	30.52	23.64	24.12
Aug.	15.23	23.63	16.60	51.63	....	29.36	23.36	23.26
Sept.	16.55	22.81	17.58	55.98	....	27.42	23.06	23.99
Oct.	20.38	22.13	16.31	62.19	....	27.06	20.82	26.57
Nov.	23.57	20.52	16.70	73.05	....	29.25	20.58	....
Dec.	21.45	18.86	17.53	71.20	....	31.26	20.92	....
Average for Year	20.00	21.99	17.57	41.10	(*)	29.15	24.21	....

Notes: (*) Free trading suspended March 31, 1951, and resumed on July 1, 1952. (b) Price fixed by Government.

• CRUDE RUBBER
• LIQUID LATEX
• CHEMICALS

E. P. LAMBERT CO.

FIRST NATIONAL TOWER
AKRON 8, OHIO
HEmlock 4-2188
MEMBER — COMMODITY EXCHANGE, Inc.

Coumarone Resins — Reclaiming Oils — Plasticizers
Powdered Rubber

CONDUCT YOUR OWN QUIZ PROGRAM ON

RUBBER HOLLANDS

- What Rubber Holland has a high surface gloss? **BRATEX!**
- What Rubber Holland is the most pliable? **BRATEX!**
- What Rubber Holland has a minimum surface load? **BRATEX!**
- What Rubber Holland peels off clean? **BRATEX!**
- What Rubber Holland is tightly filled? **BRATEX!**
- What Rubber Holland is non-flaking? **BRATEX!**
- What Rubber Holland has uniform caliper? **BRATEX!**

BRATEX | THE HOLLISTON MILLS INC. *NORWOOD, MASSACHUSETTS*

Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car.	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car.	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car.	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,342	1,520	85,346	90,411	14,110
Passenger Car.	24,106	45,458	741	70,305	74,341	11,251
Truck and Bus	5,378	8,884	779	15,041	16,070	2,859
1953 (total)	37,949	55,124	1,543	94,617	96,150	15,720
Passenger Car.	33,106	45,798	809	79,713	81,455	13,044
Truck and Bus	4,843	9,326	734	14,904	14,696	2,676
1953:						
Oct. (total)	3,155	4,246	172	7,573	7,664	13,446
Passenger Car.	2,832	3,212	90	6,135	6,529	10,941
Truck and Bus	323	1,034	82	1,438	1,135	2,505
Nov. (total)	2,221	2,730	135	5,085	6,565	14,852
Passenger Car.	1,875	2,185	75	4,134	5,531	12,284
Truck and Bus	346	545	60	951	1,034	2,568
Dec. (total)	2,620	2,903	143	5,667	6,481	15,720
Passenger Car.	2,263	2,340	76	4,679	5,406	13,044
Truck and Bus	357	563	67	988	1,075	2,676
1954:						
Jan. (total)	2,891	3,993	118	7,002	6,299	14,977
Passenger Car.	2,549	3,378	59	5,986	5,251	12,279
Truck and Bus	342	615	59	1,016	1,048	2,698
Feb. (total)	2,634	3,557	117	6,308	7,042	15,709
Passenger Car.	2,323	3,001	60	5,384	5,952	12,832
Truck and Bus	311	556	57	924	1,089	2,877
Mar. (total)	3,163	4,350	116	7,629	7,981	16,077
Passenger Car.	2,809	3,753	45	6,607	6,878	13,112
Truck and Bus	354	597	71	1,022	1,103	2,966
Apr. (total)	3,131	4,935	176	8,243	8,065	15,906
Passenger Car.	2,785	4,328	95	7,208	7,031	12,955
Truck and Bus	346	607	81	1,035	1,034	2,951
May (total)	3,020	5,115	184	8,319	7,965	15,504
Passenger Car.	2,695	4,503	101	7,300	6,985	12,575
Truck and Bus	324	612	83	1,020	980	2,928
June (total)	2,890	6,029	160	9,079	8,796	15,218
Passenger Car.	2,587	5,326	89	8,002	7,755	12,323
Truck and Bus	303	703	71	1,076	1,041	2,895
July (total)	2,782	5,948	155	8,884	6,360	12,640
Passenger Car.	2,516	5,222	73	7,812	5,605	10,063
Truck and Bus	265	725	82	1,073	755	2,577

Source: The Rubber Manufacturers Association, Inc.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,794	1,212,790	5,533,584
1943	0	4,501	4,501	1953	6,121,787	1,202,196	7,323,983
1953:							
Jan.	453,319	111,599	564,918	July	599,134	105,622	704,756
Feb.	486,071	96,740	582,811	Aug.	513,457	101,478	614,935
Mar.	566,320	134,129	700,449	Sept.	475,289	98,051	573,340
Apr.	596,633	126,754	723,387	Oct.	528,088	91,955	620,043
May	549,677	93,443	643,120	Nov.	378,406	73,710	452,116
June	587,549	74,063	661,612	Dec.	387,844	94,652	482,496
1954:							
Jan.	454,562	96,167	550,729	July	451,663	78,507	530,170
Feb.	446,676	87,141	533,817	Aug.	445,306	75,835	521,141
Mar.	531,529	101,177	632,706	Sept.	300,998	68,618	369,616
Apr.	534,667	96,723	631,390	Oct.	.....	.....	.....
May	497,062	91,226	588,288	Nov.	.....	.....	.....
June	507,055	91,470	598,525	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
Year	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	....
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952	29,451	32,985	1,014	63,449	65,073	12,036
1953	37,957	36,072	878	74,907	74,425	11,874
1953:						
Nov.	2,222	1,708	76	4,006	4,738	11,611
Dec.	2,620	1,917	87	4,625	4,533	11,564
1954:						
Jan.	2,884	3,892	58	6,834	5,395	10,107
Feb.	2,636	2,908	74	5,617	5,896	10,448
Mar.	3,165	2,774	74	6,013	6,399	10,869
Apr.	3,134	2,770	97	6,001	6,266	11,234
May	3,017	2,900	84	6,002	5,909	11,170
June	2,889	3,657	85	6,631	5,739	10,379
July	2,707	3,471	87	6,265	4,132	8,429

Source: The Rubber Manufacturers Association, Inc.

Vinyl and Vinyl Copolymer Resins—Sales

(Thousands of Pounds—Resin Content)

	Polyvinyl Chloride and Copolymer Resins							All Other Vinyl Resins		
	Film	Sheeting	Molding & Extrusion	Textile & Paper Treating	Flooring	Protective Coatings	All Other Uses	Adhesives	All Other Uses	Grand Total
1953	63,691	62,385	129,215	52,353	22,152	22,823	27,790	22,411	77,478	480,299
1953										
July	4,638	2,821	8,580	3,376	1,507	1,798	2,500	1,859	6,402	33,481
Aug.	4,903	4,609	8,650	3,851	2,063	1,850	2,412	1,721	6,121	36,180
Sept.	5,318	4,855	9,485	4,281	2,073	1,948	2,284	2,000	5,824	38,066
Oct.	5,568	5,081	10,219	4,542	2,279	1,707	2,941	2,049	7,118	41,505
Nov.	4,507	4,126	9,443	3,615	1,447	1,561	2,446	1,755	6,711	35,610
Dec.	4,965	4,579	12,469	4,024	1,549	1,789	3,456	1,721	7,123	41,676
1954										
Jan.	4,869	5,435	10,120	4,638	911	1,614	1,731	1,825	5,988	37,131
Feb.	5,170	5,720	10,711	4,346	1,170	1,829	2,407	2,038	6,712	40,103
Mar.	7,348	6,790	12,255	4,826	1,432	2,029	2,392	2,622	6,127	45,819
Apr.	6,457	6,455	12,568	4,479	1,894	1,864	2,311	2,407	6,325	44,700
May	4,775	3,840	11,096	3,582	3,256	1,730	2,643	2,578	6,010	39,510
June	5,100	3,003	10,529	3,552	3,554	1,916	2,744	2,500	5,343	38,241
July	5,114	3,441	9,648	3,105	3,356	1,859	2,598	1,951	5,010	36,082
Aug.	7,078	4,522	14,541	4,259	3,931	2,198	3,407	2,444	5,804	48,183
Sept.	....	....	....	....	....	....	....	....	....	....
Oct.	....	....	....	....	....	....	....	....	....	....
Nov.	....	....	....	....	....	....	....	....	....	....
Dec.	....	....	....	....	....	....	....	....	....	....

Source: Chemical Division, U. S. Tariff Commission.

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Stamford, Conn.

Various Compounding Materials Consumed by the Rubber Industry

Material	1947	1948	1949	1950	1951	1952	1953
Antimony, Primary:							
Short tons	39	41	55	103[c]	19[c]	66	20
% of total	.002	.003	.005	.007	.001	.004	.001
Asphalt: [a]							
Short tons	32,113	19,967	18,050	26,819	21,414	33,288	.....
% of total	0.7	0.4	0.3	0.3	0.3	0.4	.....
Barite (Barytes):							
Short tons	17,000	18,000	14,000	19,000	15,000	14,000	.....
% of total	3.1	2.85	2.53	3.31	2.13	2.0	.....
Carbon Black:							
Short tons	471,790	435,282	383,565	515,184	530,614	537,273	566.797
% of total	94.3	95.5	93.3	92.9	93.9	93.1	94.4
Clay, Kaolin:							
Short tons	166,201	176,965	197,341	263,306	231,331	240,982	.....
% of total	11.5	11.3	13.1	15.0	12.7	13.2	.....
Clay, Fire & Stoneware:							
Short tons	17,970	15,480	27,148	9,500	.....	9,322	.....
% of total	0.2	0.2	0.3	0.1	.....	0.1	.....
Lime:							
Short tons	589	1,154	715	908	1,126	2,000	.....
% of total	0.01	0.02	.0002	.0002	[d]	[d]	.....
Litharge:							
Short tons	2,205	2,835	1,398	3,047	2,641	2,109	.....
% of total	1.3	1 8	1.2	1.7	1.7	1.5	.....
Lithopone:							
Short tons	3,085	4,192	3,245	4,092	3,295	1,523	.....
% of total	1.9	3.0	4.1	3.9	3.2	2.5	.....
Mica, Ground:							
Short tons	3,900	4,372	3,856	5,776	6,551	5,126	.....
% of total	6.0	7.0	7.0	8.0	9.0	7.0	.....
Sulfur:							
Short tons	72,800	70,560	59,360	75,000	75,000	75,000	.....
% of total	1.8	1.7	1.5	1.3	1.6	1.6	.....
Talc: [b]							
Short tons	71,840	66,226	53,400	75,900	70,970	64,476	.....
% of total	13.9	13.0	12.0	12.0	11.2	10.9	.....
Zinc Oxide:							
Short tons	82,248	82,895	58,496	82,944	71,507	72,774	.....
% of total	51.2	54.9	52.5	51.6	48.4	51.2	.....

Source: U. S. Bureau of Mines.
Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes prophyllite and ground soapstone. (c) Does not include precipitated antimony sulfide as in previous years. (d) Negligible.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude [a]	Exports	Stocks On Hand at End of Period
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	28.6	14,722	45,082
1952	274,981	280,002	22.2	11,180	30,664
1953	298,336	285,050	21.3	11,597	32,319
1953:					
Oct.	23,649	21,944	20.8	823	30,692
Nov.	21,323	19,638	20.5	1,086	31,226
Dec.	21,463	18,858	20.2	1,031	32,319
1954:					
Jan.	20,026	19,114	19.7	912	31,865
Feb.	21,122	19,461	20.3	941	32,393
Mar.	23,383	22,882	20.8	830	32,148
Apr.	21,658	21,883	20.8	1,050	31,359
May	21,316	20,536	19.7	1,071	31,105
June	22,342	22,321	20.0	1,068	30,845
July	18,041	16,301	20.5	586	31,304
Aug.	15,587	17,432	22.2	827	27,961

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon [b]: Tire Cord not Woven	Rayon and Nylon [b]: Tire Cord and Other Tire Fabrics	Rayon and Nylon [b]: Total
1952:							
Jan.-Mar.	11,226	36,378	12,971	60,575	14,434	72,249	86,683
Apr.-June	4,661	24,612	10,742	40,015	16,874	81,249	98,123
July-Sept.	335	9,257	9,460	19,052	18,128	80,355	98,483
Oct.-Dec.	c	4,728a	11,580	16,308	19,436	81,171	100,607
Total*	15,887	74,834	48,280	139,001	68,873	323,106	391,979
1953:							
Jan.-Mar.	c	4,378a	15,477	19,855	20,487	91,742	112,229
Apr.-June	c	5,713a	15,880	21,593	18,906	95,711	114,617
July-Sept.	c	3,562a	13,193	16,755	18,597	89,821	108,418
Oct.-Dec.	c	2,460	11,569	14,029	19,664	79,259	98,293
Total*	c	16,113	57,103	73,216	77,654	370,137	447,791
1954:							
Jan.-Mar.	c	2,585	13,229	15,814	17,297	78,388	95,685
Apr.-June	c	4,067	12,830	16,897	12,436	75,153	87,589
July-Sept.	.....	.....	.....	.....	.....	.....	.....
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: Bureau of the Census, U. S. Department of Commerce.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord woven. (d) Included with chafer and all other tire fabrics. * Revised.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1947	1948	1949	1950	1951	1952	1953	1954
Jan.	57,057	61,308	63,125	66,981	80,670	86,863	89,634	89,852
Feb.	50,551	56,487	57,980	53,274	72,864	82,043	86,458	86,206
Mar.	59,947	68,171	73,282	78,780	86,962	87,065	98,158	101,549
Apr.	64,140	72,183	75,318	80,350	87,573	98,653	102,044	103,866
May	70,865	77,186	81,665	89,035	100,266	101,137	105,918	104,418
June	71,329	78,044	83,374	90,174	96,364	99,305	114,703	113,037
July	73,441	81,428	83,129	91,677	100,567	105,307	112,960	.....
Aug.	72,089	80,351	84,707	94,507	101,453	102,954	109,124	.....
Sept.	71,384	76,159	80,832	86,725	91,891	100,095	106,158	.....
Oct.	73,277	75,164	79,327	89,067	100,209	103,689	106,037	.....
Nov.	64,158	72,560	76,346	82,688	88,581	91,326	99,210	.....
Dec.	67,506	72,162	75,628	81,032	84,551	95,817	100,225	.....
Total	795,015	871,270	913,713	994,290	1,091,951	1,154,254	1,230,629	.....

Source: U. S. Bureau of Mines.

Rim Production

	1949	1950	1951	1952	1953
Passenger Car	27,715,344	35,096,404	29,145,367	24,936,844	31,318,461
Truck & Bus	4,238,174	6,625,129	6,877,419	5,752,674	5,228,321
Agricultural	2,695,430	2,853,483	3,019,581	2,073,116	1,943,487
Earth Mover	9,895	15,602	28,026	31,791	24,685
Total	34,658,843	44,590,618	39,070,393	32,794,425	38,514,954

	1954: Apr.	May	June	July	Aug.	Sept.
Passenger Car	2,336,375	2,297,021	2,339,894	1,651,127	1,742,770	1,532,839
Truck & Bus	412,640	420,449	389,065	228,013	204,131	399,819
Agricultural	141,358	104,504	117,523	82,385	67,963	82,856
Earth Mover	2,498	2,890	2,206	472	323	2,204
Total	2,892,871	2,824,864	2,848,688	1,961,997	2,015,187	2,017,718

Source: The Tire & Rim Association, Inc.

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